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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE CULTIVATION OF CORN.

Read before the Agricultural Society of Fredericksburg, and ordered to be published in the Farmers' Register.

The corn crop is so important to the tide water portion of Virginia, that observations upon its culture, however trite or desultory, can hardly fail to be productive of some benefit. The following are offered as the rusult of twenty years' experience, by one who has been a corn-grower for that time, and probably as successful as most of the farmers who live in the same section of country, and own similar land.

The field intended for corn should be ploughed up as early as possible. My usual practice is, to give the team a week's rest after the fall weeding is finished, then to start as many ploughs as I can, and to keep them at work whenever the weather will permit. I am thus enabled to get through with the wet and stiff land by Christmas, and to finish the residue of the field early in the spring. If wet land is postponed until the spring, it is often so late in drying, that the farmer becomes impatient, ploughs it out of order, injures the land and fails in the crop. As the ploughing advances, the small artificial drains to be found in most large fields should be well opened. If they are permitted to remain filled up with the earth thrown into them by the plough, small ponds of water, soaking through and injuring the land considerably beyond their limits, will be formed during the winter; which spots, being insufficiently dried when planted, will put forth sickly, unthrifty plants, and yield a very inadequate return. The depth of the furrow, must depend upon the charater of the soil. I believe the proper limits to be from three to six inches, having been satisfied from experience, that deeper ploughing sometimes injures the land, and always the team, without any benefit to the crop. A two-horse plough is fully adequate to such work, is less expensive, more easily managed by the ploughman, and less worrying to the team, than a larger one. Some other benefits resulting from this early ploughing, are, that the heavy work is done when the weather is cool and the days short, the plough horses are easily kept in good order, the land is loose and friable in the spring, and the farmer gets sufficiently advanced to be prepared for untoward occurrences and emergencies. This last advantage applies to all agricultural operations, and is so highly estimated, that I am not aware of any thing of more constant application or greater value to the farmer, than to admonish him to be beforehand with his work. If he starts or gets behindhand, he keeps so, and every thing, afterwards, is done out of time, or evinces a hurried and slovenly execution.

The field is ploughed in five-feet beds. I say this in reference to the corn-crop, and a level surface only. If wheat is the staple, other systems are probably preferable; and when the land is rolling, I have found no means so effectual, not for preventing, but for diminishing the great damage occasioned by heavy rains, as to avoid bedding and to preserve as much as possible, the natural surface. In the tide-water district, the corn crop is so decidedly superior, that it cannot be sacrificed to any other crop. The five-feet bedding exposes the land more effectually to the action of frost in winter, and of the sun and winds in spring. The crop can therefore be planted earlier, comes up and grows off more rapidly, sooner matures, and has a better chance to escape our frequent and severe droughts. Although good crops are made by earlier and later planting, the proper time for that operation is certainly the month of April; in the first half of the month, if the soil be sandy, in the latter half, if it be stiff. The modes of planting are various; but after trying most or all, I have given the preference to the plan of opening the beds longitudinally, with a single furrow of a plough, drawn by one horse, as deep as he can easily do it, dropping the grain by a line marked at the intended distances, each planter following his mark and covering with his foot. I prefer this method, because a horse going along the beds will do nearly twice as much work as when he crosses them, because every hand, (the two excepted who carry the line,) is a planter instead of being merely a dropper, because idlers are compelled to keep up with the industrious hands, because all are immediately under the eye of the overseer, because the grain is rarely covered too deep, as is often done by the hoe, and because fewer clods are left over it, the foot either pulverizing or rolling them off. Some exceptions to this practice will occur to every one. Very rough portions of the field must of necessity be covered with the hoe, and manured land cannot receive the longitudinal furrow without turning up a large part of the manure.

Experience has convinced me of the propriety of leaving at least two stalks to the hill. One half the labor of planting and thinning is saved, and, as the plough and cultivator can work across the beds, the team can perform much of the work usually done with the hoe. I believe the crop of corn is increased. Any one who will make a fair experiment, will find that corn planted five feet by six, with two stalks in the hill, will withstand the dry hot spells of our summers much better than if planted five by three with a single stalk. Last year, which was not a good one for corn, I made a trial on a large part of my field. The single-stalk corn fired earlier and more throughout than any other part of the crop, not excepting the portions containing many more stalks to the acre; and when stripped off, blade and top showed an evident inferiority. This conviction has induced me to plant thicker than is customary. The usual distance on thin soils of five and a half feet by three, will give 16½ square feet to each stalk. I plant such land five by five, with two stalks, giving 25 to the two, or 12½ to one. There are of course nearly one-fourth more stalks to the acre; and if, as I believe, each double hill will, in all respects, be at least proportionately equal to each single one, there must be a gain of nearly a fourth in the amount of product. Under these impressions, I invariably plant my thinnest land, except

when changed for experiment, five feet by five, two stalks to the hill. This distance has been diminished on better land to five by four and a half, by four, by three and a half, by three, according to quality, always preserving the double stalks. The observation of the two last years has satisfied me, that whenever I have reduced the narrow distance to less than four feet, even on the richest land, I have lost by it, and has determined me in future to increase the number of stalks in the hills, rather than decrease the distance between them. When hills of corn are two and a half or three feet apart, the circulation of air is more impeded than if they were of double that distance; and an artificial heat is thus produced far exceeding the common temperature. This may be a reason for the superiority of the double to the single stalk planting. I have little hesitation in asserting, that during the last summer, our crops of corn sustained fully as much injury from the long spell of excessive heat, as from want of rain. In my neighborhood, the only long interval without good rains, was one of a month, between the 11th of July and 10th of August: and this interval was slightly relieved by occasional showers. I have, several times in my life, made very good crops, with droughts equally long, the corn retaining its color throughout. On the 11th of July, a very heavy rain fell, and yet within two weeks the crop was fired. This must have been owing to the extraordinary heat of the weather, and not at that time to drought.

As soon as the corn begins to come up, I start as many single horse ploughs as I mean to work, running one furrow on each side of the row, along the beds, and with the bar to the hill. They are started thus early, to diminish the depredations of the feathered tribe, as well as in accordance with the rule of keeping ahead. Crows and blackbirds may be seen travelling along the newly made furrows, dividing their attacks between the worms and insects turned up, and the young corn plants, but giving the preference to the former. Having gone over the field, a cultivator is then used, going in the opposite direction, or across the beds, twice in a row if the distance between the hills is as much as five feet, and once if less. The hoe follows rapidly, as nothing need be touched, but a small space around the hill. Much of the thinning is done in weather too wet for ploughing or hoeing, and the residue during the progress of the first hoeing. The next operations are, to return the earth, or greater part of it to the corn with the single plough, and again to follow slightly and rapidly with the hoe. This process is completed by harvest, and although it requires two hoeings, they are both so slight as not to exceed, in manual labor, what is necessary for the single one, when one only is given. If the land has been well broken up, I prefer these frequent, rapid, and slight workings, to fewer but deeper ones. During harvest, the plough finishes the narrow slip left in many of the rows, and the cultivation may be considered as over, so far as the crop of corn is concerned. A very shallow working afterwards, with the skimmer, or cultivator, and hoe, is usual; but rather designed to aid the seeding of wheat, than to benefit the corn, unless the latter is unusually backward. This year I could perceive no difference between that portion of my crop which received this past-harvest-culture, and that which did not.

The kind of corn cultivated, I believe to be of greater importance than is generally supposed. Any Virginian who has travelled northwards, must have observed the difference between their crops and ours. He must have seen that the stalks diminish in size, while the crop, per acre, obviously increases; and yet ours is notoriously the soil and climate for growing corn. I think the difference may be attributed to the kind of corn cultivated, a kind which enables them to plant much thicker than we do. Here, most of us plant a large gourd-seed corn, shooting up a tall large stalk, bearing generally one, occasionally two ears, and not admitting thick planting. There, the stalk is low, is planted very thick, and bears two, three, and four small flinty ears. Not farther north than Pennsylvania, I have seen corn planted five feet by four, with three and four stalks to the hill. Counting three stalks at this distance, and allowing three ears to each, any given space, there, will yield seven or eight ears to our one; small ears certainly, but still, large enough to account for the great superiority in the product per acre. I commenced with the old full bred Virginia gourd-seed, and stuck to it for six or eight years; but finding that, on common land, many stalks were too late in curing, or did not ear at all, determined to change my seed. My next variety was the "Taliaferro white flint." This sort is touched with the gourd-seed, but is superior to it in having a smaller stalk, ripening earlier, bearing more ears, and a harder and heavier grain. I then tried what is called the "Alsop corn," resembling the Taliaferro in other respects, but somewhat smaller in stalk, and superior in number of ears, often producing two, three, and sometimes a greater number of ears. This corn I still plant. I made one experiment with the Maryland twin corn, and thought it as prolific as the Alsop; but the grain being lighter, and the stalk taller, it was abandoned. Last winter I purchased in Washington a small quantity of "Baden" corn, and planted with it a rich lot of about two acres. It came up and grew off well, was the tallest corn I ever saw, averaged five or six shoots to the stalk, and promised at one time to make a great crop. But it suffered nearly twice as much as the rest of my corn, from the heat or the drought of the summer, and was broken off by a wind in August, which did very little injury to the rest of the crop. It did not of course, fill or ripen well, and I fed it to hogs. But as it certainly had more shoots than any corn I ever saw, I have saved a small portion to plant again. Its great fault is, its extraordinary height. If it can be brought down to a proper standard, retaining its great number of shoots, it will probably turn out to be a very prolific variety.

It will readily be seen that I consider thicker planting than common, essential in making heavy crops of corn per acre. But think planting with a large kind is out of the question. At the same time, it must be borne in mind, that as we increase the number, we diminish the size of the ears, and add to the labor of gathering and husking. Every judicious farmer will decide, from experience, how far he can carry this process; and will stop as soon as he begins to doubt whether he is paid for his additional labor. Dismissing all speculation on this point, I believe we may safely plant any small variety of corn at the rate of one stalk to every ten square feet on tolerable land,

which would give about 4360 stalks, and from six to ten barrels of grain to the acre. I will only add in conclusion, that although I have frequently been deterred by the influence which custom exercises over the mind of every one, from planting corn as thick as I was inclined to, I have, in no one instance, exceeded the usual rate, without adding to the crop.

WM. P. TAYLOR.

Caroline county, Va.

ON THE CULTIVATION, PRODUCT, AND USES OF BROOM-CORN.

Read before the Agricultural Society of Fredericksburg, and ordered to be published in the Farmers' Register.

The establishment of a broom factory, in the town of Fredericksburg, may probably render the culture of the broom-corn an object of some importance to the farmers in the vicinity. Thus far, we have had little or no practical knowledge of the extent of the crop which may be gathered from any specific quantity of land, or of the value of the product. Ten or twelve acres have been cultivated by Mr. C. H. Hunt and myself, the present year; but we have made no estimate as to the amount per acre, either of the brush, by which is meant the broom part, deprived of the grain, with about six inches of the stalk, or of the grain. Nor, had we procured this information, could it have been considered a fair experiment, or a safe guide, the land being thin and a good deal exhausted, and the season unusually dry and unpropitious. We design, the next year, to measure our land, and make a careful and complete experiment, the result of which shall be laid before the society. From information obtained from Connecticut, where this article is extensively cultivated, it appears that the product per acre ranges from 200 to 1200 pounds of the brush, and from 20 to 120 bushels of grain—ten bushels of grain being considered a fair estimate for every 100 pounds of brush. It is seldom that the quantity of brush falls below 400 pounds, and not often that it reaches to 1200 pounds—perhaps a fair average would be, 600 pounds brush, and 60 bushels of grain. The grain is considered at least equal to oats for horses and cattle, and superior to buck-wheat for hogs. It is not known what will be a fair average price for the brush in our market. The manufactory is yet in its infancy, and the proprietors have not ascertained what price the market for their brooms will justify them in giving for the brush. But suppose the price of brush, properly cured, of a bright and lively color, to be five cents per pound, and the quantity produced to be 200 pounds below the New England average, say 400 pounds per acre, the producer would get $20 for his crop, equal to five barrels of corn, at $4 per barrel, and 40 bushels of grain, in every respect equal to oats, for all purposes for which they are used on a farm. It was not my intention, however, in making this communication, to enter into any speculations as to the probable value of this crop, or to present estimates founded on data so imperfect and uncertain, but merely to state our actual experience, as limited as it is, of the value of the grain. We work mules altogether. Last year, we cultivated a few acres in broom-corn, from which we obtained over 100 bushels of grain. Since the first of January, our mules have been fed exclusively on this grain. For the first few months, it was ground and mixed with chop; but the stoppage of the mills, from the drought, rendered this mode of feeding impracticable, after the middle of July or first of August; since which time, we have fed on the grain, unground, moistening it with water, a few hours beforehand, to soften and cause it to swell and expand. The mules seemed as fond of it as of any other food—have continued throughout in excellent order, and our manager informs us, they have worked with as much spirit and as briskly, as any which he has ever had the management of.

I fed my cow, also, on this grain, for some weeks, during which, there was a sensible increase of the quantity of milk, beyond what she yielded when fed on bran and chop, the usual food of our cows in town. In preparing it for the cow, boiling water was poured over it, and it was kept well covered in a close vessel, until the grain expanded and became soft. In this state she ate it with great avidity.

Ground, and properly prepared, it has been used as a substitute for corn-bread, by several individuals in our neighborhood, who speak very favorably of it. Its appearance, when cooked, is dark red, very similar to rye bread, and like it, it contains a considerable portion of mucilage and vegetable gluten, which I have no doubt renders it highly nutritious. Deprived of its husk, which gives it the dark color, by a process similar to that employed in cleaning rice and barley, it will probably become an agreeable and healthy article of diet, and a valuable substitute for Indian corn, which it very nearly approximates in taste.

WM. BROWNE.

From the Virginia Herald.

EXTRACTS FROM THE ADDRESS TO THE AGRICULTURAL SOCIETY OF FREDERICKSBURG.

By James M. Garnett, President.

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A young friend of mine, whose word cannot be doubted, has lately communicated to me a fact in regard to this most invaluable plant, which fact is certainly new to me, a corn planter of fifty years standing, and I suspect to most others of my brethren; although we surely ought to know, by this time, every important particular relative to its nature, since Indian corn has been our chief staple in the largest portion of our state, ever since its first settlement by emigrants from the old "fatherland." *This fact is*, that the full grown stalks have, at least three or four roots, larger than the surface roots, which penetrate into the earth, almost perpendicularly, to the depth of a foot or more: my friend traced them fully twelve inches by actual measurement. Those roots, from the direction in which they grow, can rarely, if ever, be broken by any implement yet used in corn culture; and *this fact* seems to afford a satisfactory solution of *another fact*, which heretofore has never been accounted for, satisfactorily. It is, that corn should, most manifestly, be benefited by every working—during its growth, if the land be in a proper state—that is, neither too wet, nor too dry; although it is equally certain, that many

of the lateral and surface roots—whose spongioles contribute to feed the stalks and grain, must, inevitably, be cut by any implement ever yet used in its cultivation. True it is, that *some* cut more roots than *others;* but to claim for any, that they cut no roots at all, is a pretension which none can be expected to believe who ever had any experience in the culture of corn. Now, if the health and vigor of the corn plants depended solely, or even chiefly, on the spongioles at the extremities of the surface-roots, each working, after these roots have spread nearly or quite across the beds—which they do before any one ceases to work them—every working then given, would do much injury instead of good. Unless, indeed, (as I formerly suggested,) the cutting process tended to multiply spongioles at the ends of the cut roots next the stalks, more than sufficient to compensate for the loss of the extreme feeders. If this conjecture be insufficient to explain the undeniable fact, that growing corn is much benefited by every working, when the land is neither too wet nor too dry, may we not consider the difficulty solved by the discovery that the largest roots, which probably produce the most spongioles, grow in a direction which saves them from ever being cut, unless by accident? But the dew roots (as some call them,) which grow around the first joints of the stalks, and are very rarely cut, likewise act as feeders; although this, I believe, is not the common opinion. Those persons, however, who doubt, may easily satisfy themselves by tracing the longest of these roots to their extremities below the surface; for they will there find small fibres with *their* spongioles; precisely similar to those surface roots which are generally supposed to be the only sources of food to their parent plants.

I cannot dismiss this highly important subject without earnestly endeavoring to impress upon the minds of all our brethren, the absolute necessity of continuing to make experiments, and many more than any of us have yet made, if we would become thoroughly acquainted with the nature and best management of the corn plant. That we are yet ignorant of many essentials to its most perfect culture and greatest production, is manifest to all but those obstinate, self-conceited blockheads who have persuaded themselves that they have reached the highest point of attainable knowledge on both points; and who are ready to reply to all attempts at instructing them—especially if in print—"Oh! *we* know all about corn; don't tell *us* any thing, *we* never read books! no, *not we!*"

But, to prove their ignorance, as well as our own, I need only ask the following questions.

Who has ever made any experiments sufficiently numerous and accurate to ascertain the best depth and distance for planting corn in the different soils most common among us, with a view to obtain the greatest product that each soil can be made to yield? Yet, upon these two circumstances, *depth and distance*, we are all certain, that the quantity of grain produced, must most materially depend? Again, who has ascertained, or even attempted it, by any trials approaching to certainty of results, whether it is best to cultivate high and dry corn land on ridges, or on a level surface? Again, who among us can say, from actual and accurate comparison, whether it is best to cross-plough, or to plough but one way? All, probably, would give some answer to these inquiries—showing that each had formed some opinion—satisfactory perhaps to himself; but I may venture to affirm, without fear of contradiction, that not a solitary man of the whole would be able to state any facts whatever upon which a corn-planter, conscious of his own ignorance and anxious to remove it, could confidently and safely rely. Here then are no less than three or four highly important matters relative to corn culture, of which all the corn-makers with whom I have ever conversed, are still so far ignorant, that no uniform and certain practice for similar soils and situations, can be adopted on their authority. As to *depth*, it is guess-work with *all*, and it will be found to vary several inches; while the distances in planting vary so much, even among the most experienced corn-planters, that 'tis manifest they act more from mere conjectural belief than any thing else. Much difference of practice yet exists in regard to all the points I have stated, which could not possibly be the case, if a sufficient number of experiments had been fully and fairly made to settle which method was best in each case. This surely is well worth attempting—at least by all who cannot rest self-satisfied, that our present stock of knowledge is full and complete, which I sincerely hope is not the case with a single member of our society—since the very basis—the great object of its formation—was *mutual instruction.*

The scripture injunction "*seek and ye shall find,*" is eminently true, not only of spiritual knowledge, but of every species which human beings are capable of attaining, and to no class of mankind is the frequent repetition of this most momentous truth more necessary than to ours; for the worst of our besetting sins is an overweening confidence in our knowledge of husbandry, and the consequent neglect of all the means essential to its improvement. Our secluded country lives, if long continued without interruption, serve only to cherish and confirm this self conceit, almost beyond all hopes of cure. The symptom which usually indicates this disease in its most inveterate state is, when the infected person is found, whenever an opportunity offers, constantly and most complacently, talking about "*his* methods, *his* system." When the disorder appears in this aggravated form, a recovery very rarely occurs, for there are only two modes of cure, and both of doubtful efficacy. The first is, to persuade the sufferer, if practicable, to go a little from home and examine *other men's methods and systems;* for he will then surely find either that *his*, upon which he has prided himself so much, as sole discoverer and practitioner, have really nothing new in them, or that they are much inferior to the methods and systems of many other persons of his own profession. The second remedy is, to tempt him to read (provided he can,) a few scraps or whole articles in print, about husbandry. If well selected, they may possibly coax him on to peruse a pamphlet or book or two on the same subject, when he will discover that the great bug-bear which he has always despised so much under the name of book-farming, is, in reality, neither more nor less than a well authenticated record of the best practices in every branch of husbandry, from the earliest ages to the present day. It is true that he would find some mere speculations,—some useless trash; but what books, except the bible, were ever yet exempt from these defects? Yet even

the most illiterate believe books to be absolutely necessary to the perfection of every honest trade, profession and calling, under the sun. Strange then, most strange would it be, if *that* calling, upon whose prosperity even human existence itself depends, should be the only one which can prosper without books! The vainest fool that ever lived, if he were not an absolute idiot, would not fail to admit this, provided you could prevail on him to think long enough to form an opinion. How shameful—how disgraceful then is it, that any of our fraternity who are certainly *not fools*, should ever be found among the idiotic declaimers against the study of books on agriculture! This study would put him in possession of *one fact*, which of itself should suffice to animate his professional exertions for the rest of his life. It is, that all the greatest benefactors of mankind have been either practical agriculturists, or the devoted friends thereof—that they have deemed agriculture not only an *art* but a *science*, to the perfection of which the study of books is indispensable; and moreover, that to the end of time, it will always fall so far short of perfection, as to leave ample room for constant improvement, even to the wisest and most experienced of our profession. To strive therefore with might and main after this improvement, and with a zeal and perseverance proportioned to its importance, should be deemed the indispensable duty of every man who presumes to call himself a friend to the great, the vital cause, of agriculture. All who give it only *lip service* should be ranked amongst its worst enemies, since the tongue alone is worse than nothing, unless the heart, the hand, and the purse, unite in its promotion: nay more, unless this union, in the case of us Virginians, should so work as to obtain legislative aid to our cause. But no man in his senses can hope it, as our legislatures are now constituted, if he judges by their undeviating neglect of agriculture, from the end of our revolutionary war to the present time; although strange to say, a large majority of them have always been agriculturists! Of this there can be but one even *probable* explanation; it is, that they must believe *party politics* to be much more deserving of their patronage than *agriculture*. To cure them of this hallucination there is only one remedy, and *that*, thank God, is still in our power, although there is some doubt whether we shall all be sufficiently alive to our own interest, to apply it. This remedy is, either to elect no more representatives without clear, unequivocal pledges to do something for agriculture, or to instruct all who will not give such pledges, that they *must* do something, or never again expect our suffrages. Why this course has not been pursued, after so many fruitless and deeply mortifying applications to our legislatures, is to me utterly inexplicable, but upon the supposition that the majority of us are stone blind to the obvious means of relief; or that those who *can* see them and are fully aware of all their momentous bearings, want the courage and perseverance to combat that fearful and most formidable obstacle to improvements of every kind, which consists in a union of ignorance and asinine indifference relative to our best interests. We agriculturists *may* and often *do* live so comfortably at home, by industry and frugality, almost in spite of government neglect, nay even of government hostility, that we remain ignorant of the vast extent to which legislative enactments have benefited agriculture in other countries, and might advance our own, if we would only exert over them *that* influence, *that* control, which our constitution has secured to us. Should we much longer neglect to do so, all argument, all persuasion, used for any such purpose, will be as entirely thrown away, as an attempt to show how a dead man's life might have been saved had a certain nostrum been administered while he was alive. Unless we mean "*to give up the ship*," in other words, to abandon our good old mother, Virginia, to her aboriginal inhabitants, the bears and wolves of the forest, and flee to "the far west," we *must* insist upon the establishment at public expense of a board of agriculture, or an agricultural school, or an agricultural survey of the state, or all three together. One or all of these means are indispensably necessary, if we would maintain among our sister states that relative rank and importance to which our soil, climate, natural resources and population, so justly entitle us. * * *

There is another of your improvements which deserves a special notice, on account of the highly important purpose, in a national view, to which it is designed to contribute; I mean the establishment of the silk-culture in the United States. This improvement is the handsome building lately erected for a cocoonery. Like others destined for a similar object, which are now preparing in various parts of our country, this house illustrates the existence of a moral phenomenon, for which no one, I believe, has ever yet been able to account. It is the liability of our minds as well as our bodies to certain untraceable diseases to which the common name of *epidemics* has been given. Such formerly in Holland, was the disease called "*the tulip mania*," which, when at its height, caused single roots to sell from 2,000 to 5,500 guilders; a sum, that in our currency, would exceed two thousand dollars. And such, within our own times, was, "*the merino mania*" in these United States, with another of more recent date, that shall be nameless. From the sheep mania and its successor, I luckily escaped, by using great precaution to keep out of the way. But I plead guilty to a voluntary exposure to what I will take the liberty to call the "*multicaulis fever*" —a disease which threatens to spread vastly more than did the merino mania; because mulberry bushes being far more divisible than sheep, and of course much lower in price, many more persons can afford to buy: add to which a thousand or two per cent. profit, seems to be confidently expected from each mulberry investment, whereas the merino purchasers, I believe, rarely anticipated much more than one or two hundred per cent.

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But to be serious: I verily believe that although this multicaulis business will certainly humbug a multitude of those ever sanguine people who calculate on amassing enormous fortunes by it, yet that it *may* prove highly profitable to all who will be prudent enough to sell at the market price, whatever it may be, immediately they have any trees or cuttings to dispose of. That this price will and inevitably must be much less 12 months hence, I think absolutely certain, notwithstanding all the prophecies you have been flattered with to the contrary. My reasons for this opinion are, that

some sellers among us are already asking less per thousand for buds than they did only a few weeks ago, which indicates that the demand is nearly or quite supplied, and that it is notorious; ninety-nine purchasers out of a hundred buy to *sell, and not to feed silk-worms*, which require a much cheaper diet than mulberry bushes at one or at two dollars each. This cheaper food will soon be raised for them by the enormous speculations in that article now raging every where and aggravated to a most dagerous height by the lust of inordinate gain. *Then* but not *until then*, can we rationally expect that the making of silk will become a regular and general business. The fact of its perfect practicablity is now established beyond a doubt by the great profits which many of our northern brethern have derived from it—although but few, compared with our whole population, have yet carried it to much extent. That we should not now see multitudes engaged in it, seems entirely attributable to the multicaulis fever, which has excited the belief that vastly more money can be made by cultivating food for silk-worms, than by raising the worms themselves.

Another reason for believing that the manufacturing of silk will become, in a few years, a permanent source of great individual and national wealth, is the enormous present consumption of this article, from foreign countries no better adapted than ours, if as well, to its production. By the report of the Secretary of the Treasury, made to congress on the 8th of May last, it appears that there were imported into the United States during the fiscal year ending on the 30th of September, 1837,

Of manufactures wholly silk	$11,114,179	worth
Of do. silk and worsted mixed	1,810,947	do.
Making the enormous total	$12,925,126	

When we add to this the probable amount of our home manufactures of domestic silk, it will not be an extravigant estimate to say, that the value of silk goods annually consumed in our country is not much, if any short of one dollar per head for every man, woman and child, in the United States!! Some possibly may ascribe this chiefly to fashon; but after making every reasonable allowance for this influence when we reflect that silk is much more lasting than cotton, and better adapted for most articles of wearing apparel, as well as several other things, we cannot for a moment doubt that its consumption will increase in full proportion to the decrease in the cost of its production. This is the natural, the constant effect, whenever the supply of any useful article whatever, either fully equals or a little exceeds the previous demand. More of it will certainly be purchased, because the reduced price brings it within the means of a greater number of consumers: and thus it is, that demand and supply will forever act and react upon each other, when trade is free.

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From the Cultivator.

THE MULBERRY.

We stood alone, among our cotemporaries of the press, for a long time, in maintaining, that the morus multicaulis was too tender to withstand our northern winters. We see our opinion now confirmed by some of the longest established growers, who, if we remember right, once maintained a contrary opinion. And we notice in a late 'Farmer and Gardener,' printed at Baltimore, Md., "directions for preserving the multicaulis through the winter,"—which consists in *taking them from the ground*, and covering them with earth in the cellar. At a late farmers' meeting in Northampton, Dr. Stebbins and Mr. Whitmarsh, who have both, we believe, for a number of years, been actively engaged in propagating and vending the mulberry, pronounced the multicaulis not suitable for our climate. We subjoin quotations from the remarks of each:

"Experience has taught us," says Dr. Stebbins, "that our climate is not congenial to the habits of the morus multicaulis plant; many thousands have been lost every year in consequence of not providing a shelter and protection for them against the frosts of autumn, and the severe cold of our winters. It has been demonstrated to us by expensive experiment, that the tree is not suited to our borean seasons."

"The principal objections to this tree is," remarks Mr. Whitmarsh, "that the leaves contain a great proportion of watery matter, which causes the worms that are fed upon them to be unhealthy, and hence injure their silk. He thought this objection would operate more seriously at the south, where the seasons are longer and warmer. The heat would cause them to grow more rapidly, the leaves would be larger, and he thought, imbibe more moisture. He regretted the universal adoption of this tree at the south, and feared that a failure caused by this fact, would retard the progress of the [silk] business ten years, by discouraging so many who would become losers."

We quote the above as affording hints that may be useful to those who are about embarking in the silk business; though we somewhat doubt if Mr. W. is correct in his objections to the leaves of the multicaulis, and we think he is decidedly in error in supposing that this objection, if well founded, will be greater at the south than in the north; the greater heat at the south decreasing, instead of increasing, the succulence or watery properties of the foliage.

These two gentlemen give a decided preference to what they term the *Alpine*, which Mr. W. says is "the kind universally used in France and Italy." We do not mean to charge these gentlemen with wanton deception, for we have a high opinion of their good standing; yet there is something so mystical in these declarations, so contrary to receive opinions, that we can not pass them as current truths, without asking for some further explanation. We have examined all the botanical and other works in our possession which treat of the mulberry, and they are neither few nor of doubtful authority—and yet we can not find in any one the term *Alpine* given to any species or variety of the mulberry. And as to the assertion that the Alpine is universally used in France and Italy, we have Gen. Tallmadge's declaration, that in Finizio's establishment, in Italy, which he visited, 3,000 lbs. of sewing silk are made a week, mostly from the black mulberry (*M. nigra;*) that Finizio stated to him, that the worm fed on the black mulberry made the strongest thread; that on the white mulberry finer and

better fabrics; that on the Chinese (*M. multicaulis*) still finer and more delicate fabrics. And we think, (for we have not the letter at hand,) that Gen. Tallmadge says the white mulberry (*M. alba*) is almost exclusively employed in France. Loudon says, "the M. alba is commonly cultivated in France and other countries, for its leaves, to feed silk-worms, though in some parts of Spain and Persia they are said to prefer the black mulberry." *Enc. Plants*, 782. The Alpine, we presume is a *variety* of the M. alba, and is probably the one alluded to by Loudon, where he says —"the most valuable variety of the M. alba is one grown in Italy, and especially in Lombardy, with vigorous shoots, and much larger leaves than the other." This may also be the Dandolo of Loudon, and the Italian of Sweet, and possibly the Brussa of Asia, from whence it may have been brought to Italy.

Dr. Stebbins advertises the public, that the undernamed (and many not named) descriptions of the mulberry, may be had of him in Northampton, viz. the Manilla multicaulis, the Canton, the *Alpine*, the *Asiatic*, the *Smyrna*, the Brussa and Dandolo. Now we protest against this fabrication of new names, for old things, whether it be from ignorance, for novelty, or to subserve the interests of the trade. Those printed in italics appear to us to be absolutely of new coinage. This unnecessary multiplication of names tends to mystify the business, to deceive the public and to retard a useful branch of national industry. We believe that all which are named in the Doctor's advertisement are merely *varieties* of the white mulberry, differing somewhat in the size of their foliage, and in their hardihood, but very little in their properties for silk.

We have no sort of objection that Doctor S. should puff his own wares, or his own kind of trees—but we do object to his doing it to the prejudice of others, and of truth—which he indirectly does when he remarks—"The Brussa and Dandolo appear to be selected white mulberry—leaf not large—tree hardy, and there are some other varieties, *which may be used for change of food!*" Now if the Docter has seen the cocoons and silk produced *exclusively* from the Brussa, he must know that the insinuation here made, that it is unfit for the *entire* subsistence of the silk-worm, and the production of excellent silk, is neither ingenuous nor true; and if he has not this personal knowledge, he has no right, as an honerable man, to give the intimation imputed to him.

The general impression is, that the M. multicaulis will produce few or no seeds. This is probably owing to its rapid and continued growth of wood—and the tree will probably fruit freely when it has attained to maturity of growth. We have yet none but young trees among us, comparatively; and it is particularly remarked of the mulberry, that young trees are shy in bearing, and that the quantity and size of the fruit increases as the tree advances to maturity.

In the East Indies, according to Loudon, the plants are raised from cuttings, eight or ten of which are planted together in one pit, and the pits are distributed over the field at the distance of two or three feet every way. These cuttings being made firm at the lower ends, soon form stools about the size of a raspberry bush, and from these the leaves are gathered. The stools are cut over once a year to encourage the production of vigorous shoots from the roots.

From the Genesee Farmer.

TREATMENT OF THE HORSE—FOOD.

The horse is one of the most useful animals that has been subjected to the dominion of man, but his treatment in the matter of food is frequently such that his powers are but imperfectly developed, and his value nearly destroyed. With too many his position is that of the slave; devoted to all manner of drudgery, and left to gather a precarious subsistence as best he may. To care for a horse seems, by many, to be considered beneath the *dignity* of the master, when the horse, perhaps, in every respect, is the worthier animal of the two.

There is scarcely any thing that can be used as food upon which the horse will not subsist. Though not precisely carnivorous, and from his structure evidently intended not to subsist on flesh, there are numerous instances in which the horse has attained a relish for meat, and in the language of one of Walter Scott's heroes, "taken his meals like a christiain." Nearly every one has seen the horse lick blood, but this is owing most probably to a liking for the salt it contains. In Bracy Clark's work on the horse, and in the 'Veterinarian,' are several cases of horses eating flesh. One, a colt, was in the habbit of putting his head into a pantry window, and stealing all the cooked beef, mutton, or veal that he could reach; pork, however he rejected. In India, horses are taught to subsist on meat by boiling it to rags and making it into balls with grain and butter, which at first, are forced down his throat. During the long marches of the Pindaree robbers, their horses will make a meal on the boiled sheep's heads, that have been slaughtered for the men. Mr. Melling, in England, had a horse that would eat beef or bacon, in preference to oats or corn, when put into the manger at the same time; and a leg of roasted mutton was his favorite dish. The author of that amusing work 'A trip to the Pictured Rocks of Lake Superior,' gives an account of a horse at the rapids of the St. Mary, which would at any time devour raw fish, and during the winter, subsisted on salted and barrelled white fish from the Superior; and the practice of feeding horses on fish, according to 'Bullock's Travels,' is common in Norway.

Hay and grain are however, the kinds of food on which those who keep horses must mainly rely for their subsistance; and the kinds of these best adapted to the horse, and the quantity required to keep him in good condition, and enable him to perform labor, are inquiries of much interest.

In this country, our hay is principally made from clover and timothy, with a mixture of June grass and red top; the quantity of the two last mainly depending on the soil of the meadow, and the time it has been laid down to grass. Where the system of rotation in cropping is adopted, clover forms a large proportion of the hay, as this grass cuts the largest weight in the shortest time, makes good hay, and is proved to be the best renovator of fertility in soil. Stewart in his 'Stable Economy,' says:—

"In England, clover hay stands in high repute

for the hard working draught horse. In the market it brings 20 per cent. more than meadow or rye-grass. Hard upland meadow hay is preferred for hunters or racers, because, I suppose, they are apt tc eat too much of the clover. In Scotland, rye-grass hay, or a mixture of rye-grass and clover, is considered the best for 'all horses. The greater part of the hay in Scotland is bad.

Hay differs very much in its quality, not only from the different plants of which it is composed, but from its method of curing, its age, and the manner of its preservation. New hay is not good for the horse. If confined to it without any mixture of oats, he is apt to be purged and consequently debilitated. The horse is fond of it, and will eat a large quantity, but such hay is difficult of digestion, and much of it passes, little altered in its appearance, and propably without having parted with its nutritive properties. On the other hand, hay which is too old, is dry, tasteless, brittle, and has evidently lost much of its value as an article of food. According to Mr. Clark, "good hay is about a year old, long and large, hard, tough, its color inclining to green rather than to white: it has a sweet taste and a pleasant smell; the seed is abundant, (proving it was not cut till nearly ripe;) infused in hot water it produces a rich dark colored tea. The less dust hay has about it the better; but from the soil, and the way in which hay is made here (England) it is seldom free from dust. In damp weather hayabsorbs much moisture, and of course weighs a good deal the heavier. The market weight of new hay till the 4th of September is 60 pounds the truss, of old hay 56 pounds.

One of the worst kinds of hay for the horse is that which has been over heated, or, as it is commonly expressed, *mow-burnt*. To cure hay well, it is necessary that it should pass through a sweating or heating process; this developes the saccharine qualities of the grass, and confers upon it addtional nutritive power. This process is the more necessary in curing green hay, and it is usually performed in the cock; (and in clover this curative process can be performed so well in no other way;) while that which stands till its juices are perfected by ripening, requires, and is capable of but a very slight degree of sweating. If this fermentation is arrested at the proper time, and exposure to the air instantly does this, the hay is the better for it; but if carried too far, or if, as too frequently the case, the hay is put into the barn too early, fermentation or heating goes on till the nutritive properties are mostly or entirely dissipated, the hay becomes rotten, black and worhless, or is in the condition that is known as mow burnt. When this kind of hay is fed to horses, they will select and eat small quanties of it; and if compelled by hunger to eat more, its bad effects will soon be discovered. It is doubtless the worst food a horse can receive; and when purchased, it is probably the dearest. To some horses, such as are employed in fast work, its diuretic qualities render it destructive; good straw is far better than such hay for any auimal; but cattle suffer less from mow-burnt hay than horses. *Musty* hay is different in some respects, from mow-burnt hay; as it is more apt to effect the wind, or produce disorders of the lungs; while it is not positively injurious or poisonous in others respects, like the first kind described. It is known by its unpleasant smell, bad color, and odor, and bitter taste. Examination shows such hay to be coated with fungi, or minute mushrooms. The smell of musty hay is most distinct when breathed upon; and a horse after eating a few monthfuls will sometimes turn from it with disgust. Old hay that has never been heated, if exposed to damp air, will sometimes become musty; and in that state is wretched stuff for any animal.

Mr. Youatt, in the 'Veterinarian,' says very justly,—

"It ought to be understood that food ought to possess bulk in some degree proportioned to the capacity of the digestive organs. Nutriment can be given in a very concentrated form, yet it is improper to condense it beyond a certain point. Corn (grain) alone will give all the nourishment which any horse can need, but he must also have some fodder to give bulk to the corn, though it need not of necessity yield much nutriment."

Let a man who doubts the necessity of feeding his horse or any thing but grain, try living on pemmican, or the concentrated essence of beef, for a while, and he would be glad of a slice of bread, though containing much less positive nourishment: even if the bread was of the coarsest kind ever compounded by Dr. Graham.

The quantity of grain allowed a horse, the quality of the hay, and the labor to be performed, must all be taken into consideration in determining his daily allowance. Baron Bulow, the german agriculturist, estimates the 8 pouuds of good meadow hay, or 7 if made from clover or sainfoin, is equal in nourishment to 3 pounds of oats. Eight pounds of good hay and 15 to 18 pounds of oats, have been proved sufficient for fast work, that is for coach horses who work only one or two hours a day, but while in use go at a great pace. Heavy team horses will consume from twenty to thirty pounds, for the necessity for limiting these as to quantity does not exist. If the work is to be fast, the hay must be limited in the quantity, or he will have a large belly, which is incompatible with fast traveling.

We know of some farmers who keep their horses on hay alone, unless some hard day's work is to be done, when perhaps half bushel of oats is allowed them in the morning. It is not disputed that a horse can live on hay; but if the farmer who treats his horse in this way would properly appreciate the advantage they derive from the oats for that day's labor, he should live on bread and water for a fortnight, and when compelled to perform a seven days labor, indulge his stomach with a slice of ham or steak. A horse kept on hay alone always has a tendency to become feeble and pot-bellied. A little grain, a few roots, or even a mash of bran, if given only once in two days will aid materially in keeping him in good heart and flesh. There is a material difference between a horse that eats to live, and one that eats to work; and it should be remembered that the stomach and bowels will hardly hold sufficient hay to keep even an idle horse alive.

Straw has been of late somewhat extensively used as a substitute for hay; and when cut into chaff, as it always should be, and mixed with the ground or boiled grain it is found to answer every purpose; and the horse will perform his work as well as on hay. If as some have contended, a quart more of oats daily is required where straw is substituted for hay, there is still a saving, where,

as in this country, straw is by the farmer considered of no value. In many parts of Europe, wheat, barley or rye straw, forms the whole, or greater part of the dried herbage used as fodder, hay being almost unknown. Here it is little used as food; the use to which it is put, is littering the stable, and for this it is too much neglected. If farmers who keep a stable of horses (and they cannot be dispensed with where wheat is extensively grown) would adopt the mode of grinding their oats, and using straw made into chaff, for which purpose Green's straw-cutter is most admirable, they would effect a material saving, besides being enabled to keep an additional number of cattle or sheep on the hay now necessary for their horses.

In the United States, barley has never met with much favor as food for the horse. Whether this is owing to the fact that little has been used for that purpose, and consequently the best mode of feeding it is unknown, or whether the climate renders the grain itself unsuitable, does not seem to have been clearly decided. We think the first is the cause; since in Europe it is extensively used for horse-feed, without the least injurious consequences; and the robbers of Arabia, and the Turcoman of Bokkara, use no other grain, or very rarely any other, to feed their fleet and beautiful horses. Pounded and mixed with water, or when it can be had, with milk, the Arabian horse defies fatigue; and with a few pounds of barley meal daily, and the scanty herbage which in a few favored places is found in the desert, he keeps in high condition through the year. While, however, oats can be grown so much more easily than barley in much of our country, the culture of barley for horses will be little attended to by the farmer.

Next to oats, corn is the grain most used for feeding horses in this country; and in some parts, as in the southern states, it is almost the only grain they receive. The excellence of the southern horse generally, his spirit and capability of enduring fatigue, are decided proofs that the unfavorable impressions entertained in England and some other parts of Europe of this grain as horse feed, are entirely without foundation. We have tried oats, corn-meal, and shorts, with cut straw, as food for the horse, and on none of them did he thrive better, have more perfect health, or perform severe labor better, than when fed with the corn-meal and straw. Some precaution is necessary, when changing from oats, or shorts, to corn; as the latter contains far more nutriment than the others, and is more stimulating; and if given in equal quantities is apt to be injurious to the animal. And the same remark is true in regard to barley or wheat.

Neither corn, barley, or wheat, should ever be given to horses without first being ground; and if oats are first submitted to this process, a very great saving is effected. Straw should never be fed to a horse without being cut, and when hay is dry and hard much will be gained by cutting this. Every one is acquainted with the fact that horses fed constantly on unground grain, or dry straw, or hay uncut, will soon have their grinders worn out, or so low as to become unserviceable, and of consequence much of the food swallowed will be unmasticated, and of very little use. The teeth of the horse prove, that by nature dried grain plants were not intended for his sole food, and if we wish to have this useful animal retain his full strength and usefulness, the laws of his construction cannot safely be disregarded.

From the Franklin Farmer.

HIGH PRICED LIVE STOCK.

Henry Clay, Jr. Esq. of Fayette county, sold his cow, Princess, a few days since, to Messrs. John and Richard Allen, of the same county, for $2000.

William P. Curd, Esq. of Fayette county purchased of Mr. John R. Bryant, of the society of Shakers, Pleasant Hill, Mercer county, Ky., a few days ago, a pair of Berkshire hogs, for which he paid $500.

Thomas H. Clay, Esq. purchased at the sale of Mr. Thos. Smith, last week, near Lexington, the improved short horned Durham calf, Grosvenor, two years old, for $700.

Kirkpatrick, formerly the property of Messrs. Offutt & Washington, of Scott county, was purchased at the same time, by Messrs. Williams, Lewis & Viley, for $600.

From the Cultivator.

GREAT RUTA BAGA CROP—MIXING SOILS.

Schaghticoke, (N. Y.) Dec. 1838.

Mr. Buel—Sir—I send you a statement of the produce and culture of a patch of ruta bagas, which I have raised the present season, the profit of which, if not the greatest, I flatter myself, is not the least which will be offered for your premiums, as the summer has not been favorable to the produce of large crops of turnips. The soil is a sandy loam, (generally so called,) but contains by far too great a proportion of sand to be termed good, and I think myself amply compensated for applying from 50 to 100 loads of clay per acre, in the increased products of the first two years. The manure was spread and ploughed in immediately before depositing the seed. They were sown the first day of June, in drills about two feet apart one way, and owing to a partial failure of the seed, which was old, a foot or 18 inches the other, which I am persuaded was an advantage to the crop, as they grew very large; one weighed over 24 lbs. after being trimmed. The after-culture was one dressing of plaster, which I think is of very great advantage to them, especially in a drought; three hoeings or weedings, in which care was taken not to earth them up at all. The harvesting is very much facilitated by using a hoe ground sharp to cut the tops as they stand in the ground, after which they are pulled with a hook; in this way two men will gather seven or eight hundred bushels of them in a day. I had 970 bushels, calculating 70 lbs. per bushel, from 126 rods, at the rate of 1,231 bushels per acre. I had another piece I think equally as good, which were not measured.

The profit of the 126 rods is as follows:

Dr. To 20 loads manure, at 25 cts -	$5	00
Carting and spreading the same -	3	00
Ploughing, rolling and harrowing	2	00
Seed - - - -	0	37½
Sowing, ⅓ day - - -	0	25

3 hoeings, 10 days, 6s - -		7 50
Harvesting, 6 days, 5s - -		3 75
Interest on land at $100 per acre -		5 50
		$27 37½
Cr. By 970 bushels ruta bagas, at 1s. 3d. - - -		$151 56
Tops for fodder, - - -		5 00
⅔ds manure for succeeding crops, -		5 32
		$161 88
Deduct charges, -		27 37½
Balance, -		$134 50

Profit $134.50. or $170.80 per acre.

I am trying an experiment in feeding them, which if important, shall be communicated to you and the public. Yours, &c.

JOHN C. MATHER.

CORN CROP.

Volney, Oswego co. Nov. 27, 1838.

Mr. Buel—Sir—I saw in your March number of the Cultivator, a premium offered on several articles of agriculture; I therefore send you a statement of one acre of corn raised by me this season, hoping that if I do not prove a successful competitor, the cause of agriculture may receive an additional witness in its behalf. The soil is a warm gravel; the corn was the twelve-rowed yellow variety. About the 1st of May, I carried on and spread, all over the ground, seventeen loads of stable and barn-yard unfermented manure, ploughed before the manure dried; bushed and harrowed the ground well, being careful not to disturb the sod, which had lain to pasture four years; and on the 14th and 15th of May, planted the same, three feet and three inches apart each way. It was dressed with seven bushels of good unleached house-ashes, mixed with one and a half bushels of plaster, when it made its appearance above ground. On the 10th June, went through between the rows both ways with cultivator; 18th June, cultivator both ways, then thinned to four stalks in each hill, and hoed out the weeds. On the 3d July, cultivator both ways, and commenced hoeing; put no more earth about the hills than we took from them, but carefully cleaned out all the weeds from the hills. The seed was prepared by rolling in tar water and plaster. The corn was cut up the 1st of September, at the ground, and shocked in small shocks, and on the 25th it was husked and housed.

The product is 110 bushels of first-rate corn, and 6 bushels of second-rate, making in all 116 bushels of corn, and four loads of stalks per acre.

Expense of crop.

Ploughing 1 day and board - -		$2 00
Bushing and harrowing 1 day -		2 00
Planting 1½ days - - -		1 13
Hoeing 4 days - - -		3 00
Horse and hand with cultivator 2 days		2 00
Cutting and shocking 2 days - -		1 50
Husking and housing 8 days - -		6 00
Ashes and plaster, - - -		1 25
Interest on land at $50 per acre -		3 50
Thrashing corn 3 days - -		2 25
17 loads manure at 25 cents	$4 25	
Carting and spreading -	4 25	
	$8 50	
Deduct ⅔ ds for succeeding crops	5 66	
		2 84
Total charges		$27 47

Value of crop.

110 bushels sound corn, at 6s. 6d.		$89 37½
6 do. soft corn, at 3s. - -		2 25
4 loads stalks, at 8s. - -		4 00
		$95 62½
Deduct charges -		27 47
Net profit - -		$68 15½

WILLIAM INGALL.

I hereby certify that I am personally acquainted with the above named William Ingall, and believe him to be a person of veracity, and that the truth of his statement may be depended on.

AARON G. FISH, *Justice.*

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

By GEORGE D. ARMSTRONG, Prof. of Nat. Philosophy and Chemistry, in Washington College, Va.

CHAP. I.

DEFINITION OF VEGETABLE PHYSIOLOGY. ITS IMPORTANCE TO THE FARMER. TYPES AND TYPICAL OR NORMAL FORMS. TYPE OF VEGETABLES. DEPARTURES FROM TYPICAL FORM.

Vegetable Physiology, is that department of natural history, which treats of the structure, and vital action of plants. Some botanists use the term physiology in a more confined sense; as embracing nothing more than a treatise on the vital action of plants, or the laws of vegetable life; assigning an exposition of the structure of plants, to a separate department, viz., vegetable anatomy. It must be confessed, that such a definition is in more strict accordance with the proper meaning of the word physiology, and also in more perfect conformity to the principles of scientific arrangement, than the one which I have adopted; yet, at the same time, it is true, that it is advisable to depart from strict scientific arrangement, where the benefits arising from such a departure more than counterbalance the evils attendant on it. Such, I think is the case, in the present instance. It is impossible to impart information respecting the vital action of plants, without giving at the same time, a more or less extensive exposition of their structure; and it is equally impossible, to give a full exposition of their structure, without speaking, occasionally at least, of their vital action. Besides this, it is so much easier to understand, and remember any peculiarity in the structure of a plant, when we know the end which is to be accomplished by it—or any thing respecting the vital action of a plant, when we know the peculiar mechanism by which it is accomplished—than when we are left in ignorance respecting these

matters, that we may doubt, whether a perfect separation of the two subjects, would be desirable, even if it were possible. Indeed, they have never been kept entirely separate, even by those who have adopted the strictest definitions. Understanding the term as defined at the commencement of this article, it is the business of the vegetable physiologist to lay open for inspection, the machinery of vegetable life, and to explain the manner in which that machinery operates; to determine the structure of the different organs of plants, the functions which they severally perform, the manner in which they perform those functions, and all the changes which they undergo, under the influence of climate, seasons, accidents, or the art of man.

"Plants whether regarded as individuals, or as grouped in the garden, the field, and the landscape, are objects of universal interest. The beauty of their forms, the delicacy, harmony, and splendor of their colors, the fragrance which they exhale, the refreshing verdure and convenient shade which they afford, as well as their more important uses, in ministering to our sustenance and comfort, connect our interest, and even our existence with theirs." The opinion, "that whosoever could make two ears of corn, or two blades of grass, to grow upon a spot where only one grew before, would deserve better of mankind, and would do more essential service to his country, than the whole race of mere politicians put together," is a dictate of the soundest philosophy. Plants being of so much importance to man, an examination of their physiology may certainly lay claim to a share of his attention.

The business of cultivating useful plants belongs to the farmer; and I here use the term cultivating in its widest sense, as meaning, causing them to spring from the earth, watching over and assisting their growth, guarding them against disease and injury of every kind, and so far as such a thing is possible, perfecting them for their intended use. The farmer who would perform well his part, has by no means an easy task. There are but few plants, which in their wild state, are suited to answer a very valuable purpose in the economy of life; and there are fewer still, which may not be improved by a judicious system of cultivation; and I may add, none which, after they have been improved, will not degenerate, under an injudicious system of cultivation. This improvement it is the interest of the farmer to effect; and having once effected, to preserve. There is no plant which is not subject to diseases, arising from the operation of external agencies upon the system of the plant itself. From these it is the interest of the farmer to protect them. There is no plant, whose growth may not be assisted by the well-directed, and well applied labor of man. The stalk of corn which has sprung from a grain dropped by accident in the uncultivated field, and thus thrown upon its own resources, and left unbefriended to struggle for existence, with the grass and weeds which surround it, cannot compare with the well cultivated stalk in the luxuriance of its growth, or in the richness and abundance of its fruit. It is evidently the interest of the farmer, to afford this necessary assistance. Plants have to be refined and civilized, (if I may be allowed to use such an expression,) in order to fit them for the use of refined and civilized man. To the farmer, the business of effecting this, belongs; and he can know but little of the difficulty of this task, who supposes that it can be well performed without the exercise of sound judgment, and the possession of an extensive acquaintance with the nature of those things, on which, and with which, he has to operate. Such being the case, we may assert, without fear of contradiction, that the principles of vegetable physiology, must enter into the very foundation of every correct and intelligible system of agriculture.

Vegetable physiology has never received from farmers, that degree of attention which it has deserved. It is true, that with many of the facts connected with this subject, farmers have long been familiar; but the general principles, and, in fact, all that constitutes its claim to a rank among the sciences, have received but little attention. This is, no doubt, to be attributed principally, to the want of some work which would present the subject in an intelligible and concise manner, and divested as far as possible, of technical phraseology. Those who have hitherto written on this subject, have generally been naturalists, perfectly familiar with the extensive latin terminology of systematic botany, and who, forgetting that the majority of those who would be, or who ought to be their readers, were not equally familiar with this language, have introduced so much of it in their works, as to make them, to the common reader, "sealed books." Besides this, most of the works which have been written on vegetable physiology, have been written professedly as introductions to systematic botany, and on this account, an extended explanation of technical terms, as well as much other matter entirely irrelevant to the subject, has been introduced. The object of the present series of essays, is to remove this difficulty (as far as the author may be able), by presenting the principles of the science in popular language; or if in any instance it may seem advisable, either for the sake of brevity or exactness, to introduce a technical term, by adding a definition at the time the term is used.

There is one consideration recommending to the farmer the study of vegetable physiology, which is not true to the same extent, of any other department of natural science at all connected with agriculture. And that is, that no complicated apparatus, or extensive acquaintance with the mathematics, is requisite, to enable a person successfully to pursue his investigations on this subject. Whatever we may learn respecting the physiology of plants, we must learn, by observing their operations as carried on around us, or by experiments so simple, that any person of common ingenuity can perform them; and any person of common intelligence can understand them. For pursuing investigations in chemistry, expensive apparatus and materials are necessary; in natural philosophy, an extensive acquaintance with the mathematics is indispensable; in geology an examination of different countries, and different parts of those countries, or at least of extensive geological cabinets, such as are accessible to few, is essential. But for investigations in vegetable physiology, we have the subjects of examination, and the materials for experimenting, at all times, and everywhere, at hand. All that is necessary to enable a person successfully to prosecute inquiries respecting this subject, is, an acquaintance with

that which is already known; habits of close and accurate observation of nature, ingenuity, and patience. If he possess these, his labors cannot fail to be crowned with success.

With these brief introductory remarks, we will now turn to the subject before us; viz. vegetable physiology, or an examination into the nature, structure, and vital action of plants. It is difficult, if not impossible, to give a strictly scientific definition of the term, plant. The division of natural objects into the three great classes, of minerals, vegetables, and animals, is one, founded upon an observation of those of their properties, which produce the most lively impressions upon our senses; and not upon an intimate and accurate acquaintance with all that belongs to them. There are certain great and striking diferences, in the structure of the more common, and more perfectly formed objects, belonging to these several classes, which we all observe. A mineral remains fixed to the same spot, and undergoes little or no change, in the ordinary course of things. A plant is continually undergoing changes; it springs from the earth, puts forth leaves, flowers, and fruit, and finally disappears, and, in due time, is succeeded by others like itself. An animal, not only lives and grows, but breathes, moves, utters sounds, and, in a thousand ways, gives evidence of the possession of a kind of life, different from that which belongs to vegetables. Upon an observation of such differences as these, the general classification of natural objects is founded.

When we turn our attention to the less perfectly formed individuals belonging to these several classes, this broad line of distinction entirely disappears; and so impossible is it to run a dividing line between vegetables and animals on the one hand, or vegetables and minerals on the other, that some naturalists, among whom we must reckon the celebrated Buffon, have contended that there is no exact boundary between them; but that at their extremities, the three great classes of natural bodies melt imperceptibly into each other. Naturalists have frequently attempted to draw the line of separation; but, hitherto, have always failed. Linnæus, distinguished them as follows: "Minerals grow—vegetables grow and live—animals grow, live and perceive." To say nothing of the unphilosophical manner in which the terms grow, and live, are used in these definitions—meaning one thing in one place, and entirely different thing in another—the insufficiency of this distinction will be apparent, if we inquire, how does an oyster manifest its perception? Only by closing its shell when touched. The sensitive plant might lay claim to this power, on grounds almost equally good. Touch it, and immediately its leaves close, and, together with its branches, droop to the earth, as if in this way to avoid further injury. The mention of a single fact, will, perhaps, set this matter before us in a stronger light. The natural order of beings, called zoophites, or animated plants, as their name imports, (of which order the coral may be mentioned, as a familiar example,) were by Woodward and Beaumont, arranged with minerals; by Ray and Lister, with vegetables; and are now, by the common consent of naturalists, admitted to a place among animals. So strongly do they, in some respects, resemble animals—so clearly do they possess many of the traits of the vegetable race—and yet, at the same time, so strange an admixture of the mineral character is discoverable in them, that those who are best acqainted with them, will be least disposed to wonder at these errors.

This gradual melting into each other, which is observable in the three great classes of natural objects, may be noticed in their sub-divisions also. The leather-winged bat, is a connecting link between beasts and birds; lizards, between beasts and reptiles; reptiles themselves, between beasts and fishes. So among vegetables. Ferns and mosses, whose seeds are evident, serve as a connecting link between the more perfect plants, and the numerous classes of lichens and fungi, the most imperfect of vegetables. So also among minerals. The numerous specimens which assume a regular form by cleavage, serve to connect those which appear as rude and shapeless masses, with those which are presented to us possessed of the high polish, and all the beautiful regularity of form which characterize the perfect crystal. In truth, we glide so smoothly, and by such imperceptible degrees, from the rock, or from the tree of the forest, through all the intervening gradations, till at last we come to intellectual man, that we discover no interval between species of beings. An uninterrupted chain connects the two extremes.

The same is true of the different parts or organs of animals and plants. From the perfect hand, that "organ of organs," as it has been termed, in view of its wonderful mechanism and admirable adaptation to the wants of men—we pass by such insensible degrees to the hard undivided hoof of the horse, that it is almost impossible to tell where one variety ends, or where the variety next below it begins. The same remarks will be found to apply with equal truth to the organs of plants. For this reason, naturalists in treating of different classes and organs of bodies, do not attempt to draw lines of distinction between them; but selecting some one individual from among the most perfect of the class to which it belongs, confine their descriptions entirely to it. The one thus selected, is called the *type;* and its form the *typical* or *normal* form of the class. After the description of the type is finished, any variations which other individuals may present, are noticed if it be thought necessary. By adopting this method, that endless controversy about terms, in which the earlier naturalists spent so much of their time, to no purpose, is avoided. As the terms type, and typical, or normal, will, of necessity, frequently occur in the following essays, it will be well for the reader to recollect their meaning.

The common garden bean, (*vicia faba,*) inasmuch as it presents every organ commonly met with in plants, may be assumed as the type of this class of things. If we examine it, we will find that it consists of the following parts: First, an irregularly divided part, in its natural situation buried in the ground, and called the *root.* Second, a green stalk or axis, to which all the other parts are attached, called the *stem.* Third, certain flat, green organs, situated at different distances along the stem, called *leaves.* These are termed organs of vegetation, because their office is, to minister to the nourishment and growth of the plant. From the point at which some of the upper leaves are joined to the stem, spring slender

stalks, bearing the flowers. The flower consists, first, of a short, five-notched green bell; this is called the *calyx*. Second, four white or pink leaves, different in form, and far more delicate in texture than the common leaves of the plant: these form, what is commonly called, the flower; in botany, they are termed *petals*, and taken collectively, form what is termed, the *corolla*. Third, ten slender thread-like organs, united throughout the greater part of their length, into two sets, one set containing nine, and the other but one; these are termed *stamens*. Fourth, at the very centre of the flower, are several small green stem-like organs, growing from the end of the young pod; these are termed *pistils*. The calyx, corolla, stamens and pistils, are called organs of fructification, because they are principally concerned in the production of the fruit.

Such is the common garden bean; and such are the organs of which all the most perfectly formed plants are composed. Lowly a species as it is, it comprehends every part employed by nature in the formation of the loftiest tree of the forest. The vast superiority in size which a tree possesses over a bean, is caused by nothing more than an endless multiplication of similar parts, constructed always upon a similar plan, adjusted to each other in the same admirable manner, and all working together in the same perfect harmony and order. The bean lives but for a summer; the oak, on the other hand, lives from year to year, and from age to age. This difference, however, is not owing to any material difference in the structure of the two species; but to a specific power of prolonging its life, inherent in trees, which plants, such as the bean, are destitute of. To get a clearer idea of the manner in which this difference in size is produced, let us suppose a bean during its summer's growth, to produce a stem with ten leaves; and that this stem is hard and perennial, instead of soft and annual. As all perennial plants form a bud at the base of each of their leaves, and as each bud is in fact a rudimentary branch, during the second year of its growth the bean may develope ten branches, and, in this way, multiply its dimensions ten times. During the third year, the same operation may take place, and the consequence of this will be, an augmentation equal to one hundred times its original dimensions; and thus it may go on increasing in geometric ratio. At this rate, a bean would soon develope into an enormous tree; and although that species never does thus change its nature, yet it is true, that every tree, during the first year of its growth, is formed upon a plan analogous to that of the bean, and never more complicated; and that its subsequent growth into a giant of the forest, takes place, upon the plan which has just been described, in a supposed case.

When we assume the common garden bean as the type of vegetables, we ascribe all the differences which exist between it and other plants, to the absence, alteration, or else multiplication, of its several parts. In assuming so important a type as that of the whole class of vegetables, it is proper that we should notice some of the more common variations in form, which other plants present. In the bean, the root is easily distinguished from the stem; and is of nearly the same size with it. Such is the fact with respect to most plants; some, however, present great variations from this, the typical form. In the relative size of the root and stem, the lucern clover *(medicago sativa)* may be mentioned as an instance; with a stem not more than six inches in length, it will sometimes have a root thirty feet long; *i. e.* sixty times as long as the stem. On the other hand, the dodder or love-vine, as it is sometimes called, *(Cuscuta Americana)* a bright yellow, leafless vine, to be found in meadows during the summer, twining around other plants, has no roots at all, except in the early part of its growth. So independent is it of all nourishment derived immediately from the ground, that if a handful of it be torn loose, and thrown upon a tree, it will almost always grow. Perhaps the most curious departure from the typical form (so far as the root is concerned,) is that presented by some species of lichens. These appear like irregular, leafy expansions, laying flat upon the ground, or more commonly upon the surface of rocks. Instead of having any regular root, the whole lower surface of the leaf acts the part of a root, absorbing nourishment for the plant from the ground. One of these species, common on the plains of South America, grows very rapidly during a rainy season, and will sometimes spread itself over a space of a square foot. When the sun comes out, drying the atmosphere as well as the plant itself, it breaks into many pieces, each piece rolling up, with its lower side outwards. In this condition, having no roots to attach it to the soil, it is blown about, the sport of every blast. But, no sooner does it commence raining again, than these pieces unroll, and spreading themselves flat upon the ground, again commence growing; each separate piece giving rise to a new plant.

The common garden bean has a strong, well-proportioned stem, standing erect, and sustaining, by its own strength, its leaves and fruit. The pole bean, a species of the same plant, has a long, slender, twining stem, unable, without assistance, to support even its own weight; much less that of its leaves and fruit. In the bean, the stem is easily distinguishable from the leaves; differing from them in form, texture, &c. In the prickly pear, *(cactus opuntia,)* on the other hand, there is no distinct stem or leaves; the whole plant having the appearance of a series of thick, succulent leaves, one growing out from the end of another. There is a South American species of cactus, frequently cultivated in green-houses, which rises into the air, like a naked green club, bearing neither leaves, nor any thing like leaves. The dodder, also, may be mentioned, as a plant entirely destitute of leaves. The leaves of the bean are green; those of the Indian pipe, *(monotropa uniflora,)* as well as all the other parts of the plant, are perfectly white; and what is not a little remarkable, turn black, wherever injured. Mushrooms have a regular stem, but no distinct leaves, flowers, or fruit. The species of fungus, commonly called puff ball, *(bovista nigrescens,)* is nothing more than a ball of vegetable matter; having neither root, stem, leaves, flowers, nor fruit distinct from each other, but all amalgamated in one common mass. Such are some of the departures from their typical form, which different plants present. A more full account of them will be given, when we come to examine the several organs of plants in detail.

Chap. II.

Elementary structures of plants. Vegetable membrane and fibre. Elementary organs of plants. Cellular, woody, and vascular tissues.

If we examine a common plant, we find it made up of roots, stems, leaves and flowers, or fruit. These we term compound organs. If we examine one of these, the stem for instance, we find that it is not a homogeneous mass, composed, like a rock, of similar particles cohering together; but that it consists of certain organized parts, in the form of cellules and tubes. These we term elementary organs, organic elements, or, taken collectively, elementary tissues. The sides of these cellules and tubes contain vegetable matter, in what is believed to be its simplest condition of organization. In this condition, it forms what are termed the elementary structures of plants. Should we commence what might be called a mechanical analysis of a plant, we would first arrive at its compound organs; on analyzing these, at its elementary organs, or organic elements; and lastly, on analyzing these, at its elementary structures. It will be necessary that we preserve some order in our examination into the structure and vital action of plants; and I do not know that we can select any better than the one thus indicated; commencing with the elementary structures, then taking the elementary organs, and, last of all, the compound organs of plants.

The elementary structures are but two; viz. membrane and fibre. Vegetable membrane, when examined with powerful microscopes, presents the appearance of an exquisitely thin, transparent, colorless film. In the living plant, it resists the action of water and watery solutions; but when life ceases, it is quickly acted upon by them, and reduced to a pulpy mass. Du Hamel, a botanist of just celebrity, supposes that vegetable membrane is composed of small organic fibres, arranged parallel to each other, and united by a glutinous substance. The fact that it tears with a ragged edge, as has been shown by Prof. Lindley, seems to favor this supposition. Yet as a matter of fact, no such structure can be detected by the microscope; no traces of lines or nettings, or any thing of the kind. On the contrary, it appears perfectly homogeneous in its structure, resembling a simple pellicle, or the film of a soap-bubble. In its simplest form, it composes the sides of the cellules of cellular tissue; a little more condensed, the sides of the sap-vessels; and still more condensed, the general covering or outer skin of the bark. From the nature of vegetable membrane, perhaps some may conclude, that it is not permeable to fluids; but such is not the fact. During the life of a plant, both liquids and gases are passed through it continually; as we shall see when we come to examine into the circulation of vegetable fluids. Indeed, the film of a soap-bubble, to which vegetable membrane was compared, although in ordinary circumstances, it resists the passage of a gas—yet nothing is more easy than to cause a gas to pass through it with great rapidity; and this too, without tearing it, or injuring it in the least.

The second of the elementary structures of vegetables, is fibre. Vegetable fibre presents the appearance of an exceedingly fine thread, resembling the thread of which a spider's web is formed. Any one who may have a curiosity to see it, can have that curiosity gratified, by taking a leaf-stalk of a strawberry *(Fragraria Virginiana)* or what is still better, of a common plantain *(plantago lanceolata)* and having broken it across, carefully separating the two parts. The vegetable fibres, which are coiled along the inside of the spiral vessels of those plants, will uncoil in great numbers, stretching like delicate threads, from one piece to the other. Vegetable fibre does not enter as largely into the structure of the elementary organs of plants, as membrane. The principal parts composed of it, are, what are termed spiral vessels. These are either formed of it twisted in a spiral manner, so as to form a tube, or else have it coiled along their inner surfaces. It is not impossible, that both membrane and fibre, are composed of a still more elementary structure. If we adopt the notion of Du Hamel respecting the composition of membrane, this would seem very probable. Nothing more would be necessary, than to give to these constituent fibres, an arrangement somewhat different; placing them end to end, instead of side by side; and vegetable fibre would be more easily formed from them, than membrane itself. Still this must be looked upon as nothing more than a mere speculation; the microscope reveals to us distinctly, the existence of membrane and fibre; but beyond this it does not go.

Pursuing our inquiry into the structure of plants, the parts which stand next in simplicity to the elementary structures, are what are termed elementary organs. These appear in three different forms, viz., cellular, woody, and vascular tissues. To these we will attend in the order in which they have been mentioned.

The cellular, or as some botanists term it, the vesicular tissue, is the most abundant of the three. If a transverse section of the elder *(sambucus canadensis)* be examined with a good microscope, it will present the appearance of a fine honey-comb, made up of little hexagonal cells. If a part of the same pith be boiled in water containing a small portion of potassa in solution, it may be separated into exceedingly minute bladders, by rubbing it between the fingers. It was these bladders, which, having been cut through, presented the honey-comb appearance noticed in the first instance. In their natural state, they adhere firmly to each other; but being boiled in a weak solution of potassa, their adhesion is destroyed, and they are set free. The pulp of the strawberry consists of similar cellules; and in this instance they adhere so loosely, as to be separated by simply rubbing the pulp under water. The cellules in the pith of the elder are empty, those in the pulp of a strawberry, are filled with a sweet red liquid. The cellular tissue is made up of these cellules, or little bladders, adhering together.

In size they vary much in different plants, and even in different parts of the same plant. Their most common size is from $\frac{1}{400}$ th to $\frac{1}{300}$ th of an inch in diameter. From this they vary, so as to measure in some instances $\frac{1}{30}$ th, and in others not more than $\frac{1}{1000}$ th of an inch in diameter. In general, they are smallest in the leaves, larger in the stem, and largest in the roots of the same plant; and larger in succulent and annual plants,

than in trees and shrubs. It has been calculated, that a large gourd contains 47,000,000,000,000 of them; a number so great, that it is difficult for the mind to form a distinct idea of it without something to compare it with. Prof. Lindley illustrates in this way. If all the cellules of such a gourd were arranged in a line, and two hundred of them stretched an inch, which is about their size, they would extend about nine hundred miles. The cellules of the gourd are larger than those of most plants. In some plants, and in some parts of plants they are only $\frac{1}{1000}$ th of an inch in diameter. Of these it would take a million to cover a square inch of surface; and of course a million million to form a mass measuring one cubic inch.

The cellules of the cellular tissue present a great variety of forms. Of these, the sphere is assumed as the typical or normal form. The most common, modified, or secondary forms, are, the eliptic and oblate spheres, disk, and six and twelve-sided prisms. The typical form is that which the cellules most frequently present. The next most common, is that of a twelve-sided prism, produced by the moderate pressure of six surrounding cells upon one. When the pressure of the six surrounding cells is considerable, in consequence of each cell being distended to the utmost by the liquid which it contains, and at the same time, confined within narrow limits, the form of the prism is necessarily hexagonal. A very pretty illustration of the action of these same causes in producing a similar effect, is afforded by blowing a number of soap-bubbles within a limited space; for instance, in the bottom of a tumbler; each of these bubbles will be found to be a perfect hexagon. If whilst the latteral pressure is considerable, the upward and downward pressures are but slight; a compression of the sides of the cellules will take place, and at the same time, an extension of their ends. In this way, an eliptic sphere, or even a cylinder, may be produced. This is, in fact, very frequently the case. Plants enlarge much more rapidly in a vertical, than in a lateral direction; and, as the consequence, it is found that the cellules very frequently have more or less of the form last mentioned. If the pressure is very great on two opposite sides, whilst it is slight in every other direction, an oblate spheroid, or a disk, will be produced. If the pressure is great in every direction, but particularly great on two opposite sides, the cellules assume the form of their parallellograms. Thus the form of the cellule is determined by the circumstances and situation in which it is produced.

There is a common and very important modification of cellular tissue, to which the name of dotted ducts, or canals, has been given. These ducts are formed of series of short cylindric or prismatic cells, placed end to end, so as to form slender columns, extending the whole length of the plant, in which they occur. During the early part of the life of a plant, these cylinders are entire, and, consequently, each column is composed of a vast number of closed cavities; but, after a time, the ends of the cylinders are torn open, and the cavities communicate with each other, so as to form a tube. At the places where the cylinders join, oblique dotted lines are seen externally, and hence this class of organs have received the name of dotted ducts. Cellular tissue is generally formed of vegetable membrane; and membrane of an exceedingly fine and transparent character. The membrane which forms the cellules of the pulp of a strawberry, is so transparent, that the red liquid which these cellules contain, appears of almost as bright a red as it would if nothing were interposed between it and the eye. The same remark, will apply to the cellules of a common green leaf; for in no instance does the coloring matter reside in the sides of the cellules, or in the membrane of which they are composed, but always in the liquid which they contain. This membrane, however, is not always of so thin and transparent a character. In the hard shell of the stones of fruit, it is so thick that the very cavities of the cells are all filled up with it. Vegetable fibre, sometimes, though rarely, enters into the composition of cellules. When it does thus enter, the cellules are usually composed of one long fibre each, coiled up so as to form their sides; and not of several, crossed or interlaced.

Such is the cellular tissue. It enters into the composition of almost every part of the vegetable structure; it constitutes exclusively the pith; enters largely into the structure of the leaves, sepals, petals, stamens, pistils and seed; and is altogether absent only from the plates of pure woody matter of the stem, and from what are commonly called the veins of the leaves, which are in reality parts of the woody system. Sea-weeds, lichens, mushrooms, mosses and ferns, are entirely composed of it; and are therefore termed cellular plants. This tissue is supposed, to be capable, by itself, of performing all the more important functions of vegetable life; indeed, it must be, inasmuch as the class of plants just mentioned, live, grow, and multiply themselves, without possessing any other. When combined with the other tissues, it has certain objects in particular for which it is destined. One of the most important of its functions, is to absorb moisture, and gaseous matter from the earth and atmosphere; and after effecting a separation of such portions as are suitable to the nourishment of the plant, to give off those portions which are unsuitable. If a slice of elder pith, (which is, as I have already remarked, composed entirely of cellular tissue,) be placed upon the side of a watch-glass containing water, and be allowed to communicate, by ever so small a space, with that water, the whole mass will speedily become saturated; and, on the other hand, it will as speedily part with its water, if exposed to a dry atmosphere. Possessing, in so high a degree as it does, the power of absorbing and giving out fluids, it is well adapted to the transmission of the fluids of plants, from place to place. When composed of cellules of a spheroidal shape, it can allow fluids to pass indifferently in whatever direction a higher propelling force may exert itself. When the cellules have any other figure, they will conduct the fluids most rapidly in the direction of their greatest diameter. In the pith, the cellules are of a spheroidal shape, and conduct the sap to whatever part of the adjacent tissues most need it; in the medullary rays, (those lines apparently of hard woody matter which may be noticed in a gross section of the trunk of a tree, extending from the bark to the centre,) on the other hand, the cellules of which are thin parallellograms, with their principal axes directed from the bark to the pith, the sap is conveyed in a horizontal direction, only. Besides, absorbing, giving off

and transmitting the fluids of plants, the cellular tissue is the principal instrument in their elaboration; that is, in the conversion of the crude sap into the sugary, resinous, oily, acid and saline vegetable secretions.

The next in order, of the elementary organs of plants, is the woody tissue. This consists of slender, tough tubes, tapering to sharp points at each extremity. These little tubes are so placed, as that the end of one overlaps that of another; and in this way they form long fibres, running lengthwise through the plant. The fibres of hemp, *(connabis sativa,)* or flax, *(linum usitalissimum,)* may be selected as good specimens of woody tissue. If we examine, with a good microscope, the finest filament of flax, we will find that it is not a simple fibre, but is made up of numerous fibres of different lengths, very closely joined together, and overlapping each other by their slender extremities. By continued maceration in water, or by boiling in very dilute nitric acid, their cohesion may be destroyed, so that by careful management, the simple vessels may be obtained in a separate state. In hemp, their diameter is about six times less than that of a common sized human hair; in many plants, however, it is somewhat larger than this. These vessels, as has been mentioned, are hollow tubes. For a long time, they were believed to be solid; but more careful examination has shown that, in this particular, the early botanists were in error. The great use of the woody fibre, is, to protect the more delicate organs, and to give strength to every part of the vegetable structure. It may be considered the bony system of plants. If it were not for it, the stem of an oak would be as brittle as that of a mushroom; but lying as it does across the cellular tissue, it binds it together, and renders all the parts tough, by its own elasticity and strength.

It occurs in what is commonly called the wood of the plants of which it forms the principal part; in the bark, in small quantities; in the veins of the leaves, and in the husk of most fruits. It appears highly probable, that in addition to the uses just mentioned, woody fibre has the office of conveying fluids in certain directions. The fact that the extremities of its tubes are closed, instead of forbidding, favors such an idea, as we shall hereafter see. It is true, that from the impossibility of observing the progress of fluids, in parts so minute and so easily injured as the vegetable tissues, no one has been able to demonstrate this by direct observation. Yet we can hardly doubt that such is the case, when we consider how rapidly the sap flows up the stem of a tree, which consists to a very large extent of woody fibre; and further, that when colored infusions are made to enter plants, they are uniformly found to pervade the parts composed almost entirely of woody fibre. We may draw an argument to support the same notion, from the structure of the woody tissue. Its structure is such as fits it for this office; and so universally do we observe in nature an adaptation of means to their ends, of structures to their offices, that we may, with very little danger of error, infer the one from the other. An instance of such an inference, which will, perhaps, show the value of such reasoning as this, better than any general remarks, is afforded in the discovery of the circulation of the blood of animals. Before the time of Harvey, the blood was believed to remain stationary in the veins. Harvey had become acqainted with the nature of pumps and the structure of valves—when carefully dissecting a human body, he noticed that there were valves, placed at certain points along the principal arteries. The only use of valves, is to prevent the return of fluids after they have been forced out of their most natural position; or in other words, valves are of use only in connexion with circulating fluids. From the existence of valves in the arteries, he inferred that the fluid which those arteries contained, must circulate through them; from the structure of those vessels, he inferred their office, and subsequent observation and experiment have fully established the correctness of his inference. On similar ground we infer, that the fluids of plants circulate through the woody tissue; although we have never been able, by direct observation or experiment, to prove that they do. In fact, all the elementary organs of plants are so simple in their nature, and so much resemble each other in their structure, that it is not at all improbable, that one organ sometimes performs the work which more properly belongs to another.

The third and last of the elementary organs of plants, are the vessels of the vascular tissue. These are principally of two kinds: first, spiral vessels, and second, ducts. A spiral vessel is composed, either of vegetable fibre coiled in the form of a wire-spring, and with the edges of its contiguous coils adhering together, so as to form an unbroken tube; or else, partly of membrane and partly of fibre; the tube itself being formed of membrane, and the fibre coiled along its inner surface, so as to give it elasticity and strength. It is easy to get a sight of this fibre, in the way mentioned when treating of vegetable fibre; but in this way, we can obtain no correct idea of the structure of the spiral vessels. By carefully dissecting a boiled stem of asparagus, we can examine them, in their natural condition. Spiral vessels are found in plants during every period of their growth; even in the plantule, or embrio in the seed. They stretch through the whole length of a plant, from the root, to the extremity of the leaves. They are generally disposed in bundles, along with ducts and woody fibre; each bundle containing from three, to one hundred. In succulent plants they are found in every part of the stem; in woody plants, they always surround the pith, and form a part of the mid-rib of the leaves; they are also found in the different parts of the flower and seed. In diameter, they vary from three, to one-thousandth of an inch. In flowerless plants, such as mushrooms, lichens, &c., they are entirely wanting; from this it is inferred, that they are connected in some unexplained way, with the production of flowers and regular seed.

If a stem be cut across under water, air bubbles immediately form at the months of the spiral vessels; hence it is inferred that their peculiar office is that of transmitting gases through plants. Some botanists speak of them as the *tracheæ*, or wind-pipes of plants. When we call to mind how large a portion of every vegetable structure is composed of oxygen and hydrogen, and also how large a portion of the carbon of plants is obtained immediately from the atmosphere, we will not be surprised that a class of vessels is set apart for the conveyance of gases. Their structure is admirably adapted to their office. Had they been

formed of membrane, only, and placed in the midst of bundles of vessels always distended by the liquids which they contain, they must have been so pressed in on every side, as to have been unfitted for the performance of their appropriate duties. But having a tough and elastic fibre coiled along their inner surfaces, they are enabled to resist this pressure, and to furnish a free passage for gases throughout the whole plant.

Ducts, are membranous tubes, very much resembling spiral vessels in their form, and distinguishable from them principally by their want of elasticity, and the absence of a spiral fibre along their inner surface. The rounded cellules and cylindric tubes, of which the vegetable structure consists, cannot be applied to each other in masses, so as to fit exactly; little irregular spaces will necessarily be left between them. These spaces are termed intercellular spaces. They are usually triangular; but their form will of course be determined by the number of vessels by which they are formed. It sometimes happens, that the peculiar secretions, or products of plants, are deposited in these spaces, and pressing upon the neighboring cellules, form cavities of very considerable size. Of this nature are the turpentine cells, in the bark of the pine.

Such are the elementary organs of plants, and such, so far as is known, their offices. The influence of the vital principle, is beautifully displayed in the action of these organs. The vessels of the living plant, swollen with fluids, retain during life, their figure—change the fluids which they contain into others of the most opposite qualities—and constitute, during life, a sufficient barrier, to prevent them from mingling together. But no sooner is life extinct, than the sides of these vessels yield, the secretions mingle, and in a short time, confusion and decay reign, where, for ages, the vital principle had maintained every thing in the most perfect harmony and order.

[*To be continued.*]

For the Farmers' Register.

STATEMENT OF THE CULTIVATION AND PRODUCT OF A FIELD OF CORN.

Cambridge, Dec. 29, 1838.

Dear Sir—You requested the *result* of a corn crop which I made this year, and my *mode* of cultivation, with its *rationalia.* Though not original, because the *principles* on which it was made are well known and settled, yet it was unusual, and I have not, elsewhere, known their application in the same manner, in *all respects.*

I have, for several years, tried a few acres, under a similar culture; and finding it considerably superior, in all seasons, to the ordinary methods, I extended it this year, to forty acres; and though the drought has very much curtailed the product below the promise of the luxuriant *stalks*, yet, it is very respectable for *field*-culture.

The field in question was cultivated the previous year in corn, in the ordinary mode, having been, the same year, *manured*—about thirty loads, and *limed*, one hundred bushels to the acre. The then ensuing winter and spring, as early as possible, it was ploughed, a moderate depth, about four inches, drag-harrowed and rolled, and drill-planted, in lines four and a half feet apart, and twelve inches in the line; single stalks only left in the thinning, which operation was performed by a patent drill-machine, invented by Francis H. Smith, of Baltimore, which I have found useful, in many years' experience. With one man and two horses, this machine will furrow, drop, cover, and roll down eight or ten acres per day, and, with nearly a mathematical precision, in point of *line* and *distance.* The corn, when up, was worked with ordinary "cultivators," succeeded by one dressing with the "*scarifier*," about six inches deep. This latter implement, which I purchased several years ago, of Sinclair & Moore of Baltimore, has, in my opinion, no *equivalent* substitute, in the culture of our corn-crop; as by it, the earth may be penetrated and pulverized six or eight inches deep, with two horses, and without turning up the sward, and exposing it to the drying action of the sun and air. The cultivators, or any other harrows, (I prefer the cultivator,) are again used and continued, unceasingly, till the sward is rotten, which will generally be about the last of June, when the plough is, for the first time since the planting, introduced to turn up the sward, which, having been so long buried and undisturbed, except by the cutting of the "scarifier,"—and, under the cumulative agency of heat and moisture, is now fully decomposed, and thus incorporated with the soil, which is thereby improved, and adapted to the subsequent wheat or other small grain, which may delight in dainty and well cooked food, when the corn had flourished upon the vapors and gases of the preparatory process. After the *plough*, I take up again, the "cultivator," or any other harrow, under the classic precept, "*multum adeo, rastris glebas qui frangit inertes.*" And the drier the season, the more I use it, to promote the absorption of atmospheric moisture, which, at night, and in the driest season, is more abundant than generally supposed; as well as to assist, by lightening the *surface* soil, the *transpiration* through it, of the waters of the *sub*-soil, which being more forcibly acted upon by the greater permeability of the earth, in this loose, porous, and lightened condition, to the rays of heat, afford a considerable resource of humidity.

You have then my mode of culture, and the principles on which it is founded. I never *cross*-plough, even in ordinary wide planting, *until the sward is rotten. Because*, by this process it is turned up, and exposed to the drying and evaporating influence of the sun and air, by which even *animal* substances, more putrescent than *vegetable*, may be, and are effectually preserved from putrefaction, as in the ordinary practice of curing, as it is termed, fish, beef, &c. &c. *Because*, I have a finer culture, and the soil is better pulverized without it; and though not a thorough-going advocate of the doctrine of the well known Tull, "that pulverization, is, *in itself*, sufficient," yet, I hold it an essential co-operative, and without which, the best crop cannot be produced. And, *because*, by the operation of early cross-ploughing, unless under a deeper furrow than my experience will justify, the sward is exposed, before decomposition, to the antiseptic agencies which I have named, and becomes indurated; and, if it can then be subdued at all, it will require much cost and labor; and will, when done, have lost much of its *pabular* constituents.

In consequence of a *sweep-stake*, which I have taken, upon the crop alluded to—though conceded, and paid over to me, without measurement—yet, I held it proper, unrequested, to have a subsequent measurement and ascertainment, as accurate as possible, of the product, which I will annex.

The remarkable uniformity of the crop, and the hazard, and inconvenience of shelling the whole, so long before a future market, probably of next summer, led me to the following method, viz: "to measure one acre; to have its product carefully ascertained; and to obtain a certificate from a disinterested, judicious, and extensively known character," of the *uniformity* of the growth.

For the latter fact, I wrote to Adam Waldie, Esq., of Philadelphia, who had recently seen the field in its full growth; and because his well merited eminence, as an editor and publisher of literary and scientific journals, of extensive circulation, would give additional currency and strength to the fact; and he politely favored me with the following reply.

"I well remember the pleasant ride I had with you, through your corn-field. It really required ocular evidence to produce a conviction of the growth of such magnificent corn, in such an unfavorable season. I am really desirous to know the result; to know which, the correct measurement of one acre, I should think sufficient for all practical purposes; for, the difference must have been too small to notice."

The following certificate of the measurement of one acre, was then made by myself with affidavit.

"I hereby certify, that I carefully measured and marked one acre of my corn-field of the present year, at my Appleby Farm, and requested the overseer to ascertain the product of said acre in corn. Sworn before JNO. NEWTON,
Justice of the peace for Dorchester county."
November, 1838."

The following by the overseer, Mitchell Shore.

"I hereby certify, that I did, at the request of Dr. Muse, carefully ascertain the product of corn on a space in his corn-field, at his Appleby farm, the present year, measured and marked by him, for one acre, and that it contained seventy-one bushels, and three pecks of shelled corn, the growth of said space.

Sworn before JNO. NEWTON,
Justice of the peace for Dor. county.
November, 1838."

It will be seen that the product of my drill-field, viz: forty acres at seventy-one bushels and three pecks per acre, was two thousand eight hundred and seventy bushels of shelled corn, or, "sufficiently near for all practical purposes:" and to this may be fairly added, a part of the immense contribution levied upon all our crops by a *fantastical morality*, and *self-willed* infatuation, (I *will not* use an epithet, possibly more appropriate,) which, in disregard of the laws of God and man, preferring *idleness* and *thievery*, to *industry* and *honesty*, have turned loose upon us, a Vandal swarm of freed negroes, who work none, and eat much; and of necessity, and most notoriously, live exclusively upon the industry of others; and this year, in evidence of the progressive boldness of accustomed villainy, they have taken, and before removal, *shelled* my corn in the field to a large extent.

In this field was contained, also, thirty-five acres more, which was planted in the usual manner, at four and a half feet distance, each way; and leaving *two* stalks, upon thinning; when *one* only at a point, was left in the other; in all other respects, the culture was like the former, except that it was *cross*-harrowed at the close of the cultivation.

It will be observed that the *drill* had a little more than nine thousand *stalks;* and the other, about four thousand to the acre. The growth of this was equally good; but the product, though not accurately ascertained, as intended, was unquestionably far short of the *drill;* but not in the ratio of the respective number of stalks—the ears being larger—yet, I think the difference of product, per acre, at least one-third in favor of the drill.

I have had, under a similar drill culture, on five acres, and in a less unfavorable season, one hundred bushels per acre; and my present report may not be interesting, as to quantity, yet, under the unfavorable circumstance of an unusual drought, and a *field* culture too, the result is flattering; and I have, at least, complied with my promise to make the report.

Your politeness will excuse its length, and its blots, when I assure you, the *quo animo* was absent in both offences; and you are at liberty to use it at your *discretion, absolute.*

I have omitted any notice of the geological and topographical character of the field, and will add it, concisely, for a fairer judgment in the case.

The field and the farm, with few exceptions, is a *level upland*, and by the measurement of our state engineer, is twenty feet above mid-tide of the Great Choptank river, near which it lies: though poor, and unproductive, when I purchased it some years ago, yet it was a well constituted soil, as to "silica" and "alumina;" the latter, rather preponderating, and the former chiefly coarse; but remarkably defective of "calcareous" matter, with which, and nutritive manures, I have largely supplied it; and it is well repaying the cost and labor.

JOSEPH E. MUSE.

P. S. Exception may possibly be taken by some, to the idea of an *antiseptic agency* of "*sun*" and "*air*"—when it is notorious, that the "*oxygen*" of the air, is *one* of the agents of *putrefaction;* and, that "*heat*" is *another;* yet, it must be remembered, that these require to be associated with "*moisture,*" to produce the chemical change; otherwise they exert an energetic agency in resisting it; and, the presence of the *moisture*, must be *fixed*, and *continued*—and, not such, as casual showers, soon evaporated from the surface, would supply. J. E. M.

From the Cultivator.

CORN CROP.

Port Byron, Nov. 8, 1838.

Judge Buel—Sir—As I have been a constant reader of your valuable paper, the Cultivator, from its commencement, and think I have received much instruction and profit by it, I take the liberty to state to you some facts, that I think may be for the encouragement of some farmers.

Some time in March last, I commenced drawing manure from the barn-yard with two boys and a pair of steers, for the purpose of making them handy; the most of the time we used a horse before them. One of the boys lives with me, the other I hired at $5 per month. We drew the manure on a clover lay of three years' standing, about three acres. We put on the whole, 150 common wagon loads, spread it as even as we could, then ploughed, turned it over smooth, rolled and dragged it well, and planted the 11th and 12th of May, with Robbins' drill-barrow; planted what we call the 12 rowed yellow corn, but some ears have 20 rows, and from 10 to 15 inches long. Aimed to have the rows 3½ feet apart, hills from 1½ to 2 feet; from 2 to 3 kernels in a hill; rows north and south. I soaked the seed first planted in warm water, with a little saltpetre in it. The drill did not work well; I then took the dry seed and planted the remainder of it, which generally came up well; but before I knew it, the crows and worms had devoured a great deal of it. I planted it over, and part of it the third time, with the little golden corn. It nearly all stood finely. I went through it three times with a horse and cultivator; hoed it well the first time, was not quite so particular the next. I think it the best piece of corn that I ever saw in the state. Sometime the fore part of September, we cut it up at the roots, and stooked it up, but did not husk any until 15th October. It turned out so well, and was so sound, that I thought I would measure an acre, and see how much was on it. So we took the August No. of the Cultivator, the square and a rope measuring two roods long, went to the field and measured an acre, according to the rule laid down in said number; we measured the wagon box, or first load, 24 baskets full, holding almost 1½ bushels each; we had on the acre 169 baskets, or seven loads and one basket. We took one basket out of the heap, just as it came, and shelled it, and it weighed 37½ lbs. We husked a load more, and Mr. Cronkhite, one of my hands, thought the corn was still better; we then measured another acre as accurate as possible in the same way, 12 rood 3 feet by 13 rood 2½ feet; we husked off of that 166 baskets, or seven loads, wanting two baskets; we shelled one basket as before, and it weighed 39½ lbs. of shelled corn; the corn was husked and thrown down, the wagon going round to gather; shook down the corn, so that the loads might have been a little larger, and the corn rather sounder as there was not so much damage done on the second acre by crows, &c. Thus you see, the first acre had on it 112 bushels 23¼ lbs, of shelled corn; the second had on 118 bushels 28 lbs. or 118½ bushels; the second acre had on it eight loads of pumpkins. The stalks are well saved, and are excellent fodder. I sowed turnip seed on the whole piece, but the corn and pumpkin vines so covered the ground, that the turnips are worth but little; a few bushels grew to good size since the corn was cut.

Expense of crop.

10 days with team and boys at manure	$10 00
5 days with young man and team do.	7 50
Parts of days ploughing, perhaps 5 -	7 50
1 day with drag at 12s. - -	1 50
1 day planting at 6s. - - -	1 75
1st hoeing, went through with horse and cultivator, 3½ days, with 2 men and 2 boys, worth - - - - -	5 37
2d hoeing, 2 men and 2 boys 2½ days each - - - - - -	3 75
3d hoeing, 3 men and 2 boys 2 days each - - - - -	4 75
4½ days cutting up, with a man and boy	3 94
	$46 35
One-third of the above, is	$15 35
3½ days husking 1 acre with 2 men and a boy - - - - -	5 25
Whole expense of one acre -	$20 60

Value of crop.

118½ bushels of corn from an acre, at 6s. 6d. amounts to - - - -	$96 31
8 loads of pumpkins, worth - -	8 00
Stalks would sell quick at - -	4 00
	$108 31
Deduct expenses - -	20 60
Net profit of one acre -	$87 71

I am yours, with great respect,
JOSEPH F. OSBURN.

Mentz, Nov. 13th, 1838.

This may certify, that I helped raise the said corn, or tend it, and measure, husk, shell and weigh it, and believe the above to be true to the best of my knowledge. JOHN HADDEN.

This may certify, that I helped measure the 2d acre as above, and husk it, and believe the above statement to be true. ABRAM KELLS.

P. O. Port-Byron, town of Mentz, Cayuga county, 17th Nov. 1838.

I am personally acquainted with Mr. Joseph F. Osburn, and have no hesitation in saying that his statement contained within, is in all respects true; and further that any statement in agriculture coming from him may be relied on.

HORACE PERKINS, P. M. & J. P.

For the Farmers' Register.

REMARKS ON PENNSYLVANIA FARMERS.

For the benefit of travel to a member of my family, I left home in August, and was absent during the month of September, and a part of October. My wanderings were confined to some of the counties of Pennsylvania, east of the mountains. As I moved slowly, I had an opportunity of making some observations on the state of the country, and its agriculture. The farmers there depend but little upon books; few of them have heard of the theories and experiments of the Count Chaptal, and Sir Humphry Davy; but their practical agriculture and economy are of the best order. It is not uncommon for the southerners to esteem lightly the intelligence of the Pennsylvanians, (not including Philadelphia, where regular lectures, are delivered on all sorts of science, and the English language spoken in its purity;) but, as far as I was capable of ju lging, the farmers

there, have as much useful, and practical knowledge, as I have found among people of the same class in any other section of the country. A gentleman farmer to the south, who commits the management of his affairs to an agent, has more time for curious inquiry and speculative theories; he rides his hobby at leisure, sometimes at the expense of a desperate fall; but it may be well doubted, if his pursuits be more profitable to himself, or to the public, than those of the Pennsylvanian, who sees carefully to his own business, and at need will lend a hand on its execution. It is quite certain, that the latter will "make two blades of grass grow on a spot of ground," and of much better quality, where the former will make but one. Popular delusions in most free states, will have an occasional run, and Pennsylvania has had its full share; but as far as my observation extends, excessive banking, anti-masonry, and the pernicious spirit of abolition, are on the decline. I hope I do not violate the laws of the Register, in saying that I think the "dark" oracles of Governor Ritner, in relation to the south, contributed to defeat his re-election.

Mr. Buckner in a late communication to the Register, states that the lands of upper Fauquier, for the production of grass, are not surpassed by any in the United States; if he rightly estimates the nature of the soil, it has not yet attained its ultimate point of production, and profit. I learn from his communication, that when red clover wears out in the fields of Fauquier, like the improved lands of the Eastern Shore, it is succeeded by blue grass. In Chester county, green grass follows red clover, which is greatly superior to blue grass, as it makes excellent hay, the richest pastures, and when the land is put in cultivation, having no fibrous roots, is easily subdued by the plough. A field set strongly in blue grass, requires a laborious hoe-cultivation to subdue it. I should deem it a hopeless, and injudicious enterprise, to attempt to put into fallow wheat, by the plough and harrow, one of my improved fields, which had been three years out of cultivation. Green grass like white clover, is a native grass. I I found it on my farm in small parcels, since my return home; I had heretofore not distinguished it from blue grass. Gen. Evans, an experienced, and intelligent farmer, informed me that he recollected when blue grass succeeded red clover, in Chester county. I infer from these circumstances, that green grass is brought into full growth by high improvement, and judicious cultivation; and perhaps the day is not far distant, when the fields of Fauquier, and some of best in lower Virginia, and the Eastern Shore of Maryland, may be clothed with rich crops of green grass. As a further evidence of its value, I quote a Philadelphia butcher, who told me that the best beef which came to that market, had pastured on white clover and green grass. White clover soon fails under our summer sun. Green grass is a hardy plant; though blasted by the severe drought of the summer, it recovered under the autumnal rains; and I saw it in great luxuriance and beauty, the last week in October. It would be worth the cost to a Virginia gentleman engaged in grazing, to visit Chester county in the summer; he might mix pleasurable relaxation with the more sober pursuits of improvement. The Yellow Spring is a fashionable watering place, resorted by some of the *elite* of Philadelphia, who, out of their own city, are civil and courteous to strangers.

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Eastern Shore, Md., 14th Dec., 1838.

From the Boston Magazine of Horticulture.

THE MORUS MULTICAULIS IN NEW ENGLAND.

This valuable tree has again, after the lapse of two years, been brought into notice, and from the many experiments which have been made upon it, in feeding the silk-worm, all of which have attested its excellence over all varieties, there has been a great demand for the trees. To such an extent has this demand been carried, that trees, which could not have been disposed of last spring at scarcely any prices, now command from fifty to seventy-five cents each. The consequence has been, that many, who were the fortunate possessors of large quantities of these trees, have realized handsome fortunes. Many individuals, stimulated by the stories which have been circulated in the newspapers and agricultural publications, of the immense profits which have been made in the sale of the trees, have entered into the business, purchased trees, and, though wholly unacquainted with them, have, in most instances, sold at an advance which has afforded them a good profit for their time and labor.

In New England, the cultivation of the mòrus multicaúlis has been almost wholly abandoned. Most nurserymen who formerly commenced their growth in considerable quantities, after having found that the sale of the trees was in no way proportioned to the ratio of increase, have, latterly, paid but slight attention to their cultivation; and now that the demand has been so great, and the prices so exhorbitant, they have but a small stock to offer, on which they might realize many hundred per cent. profit. The severity of our winters, for the three or four past years, has been such as to destroy thousands of trees; and farmers and others, who have left their trees exposed with the hope of acclimatizing them, have lost their whole stock; while other individuals, though not so unfortunate as to lose their trees in this manner, have, from a want of faith in the silk manufacture, taken no pains to increase their stock, and the present period has found them with scarcely a sufficient number of trees to commence their growth another year.

At the south this has not been the case; the trees there stand the winter without any injury, and when once planted in the soil there is very little danger of their loss afterwards; their growth too, is immense, when compared with the trees of New England. The season, there is two months longer, and the trees consequently attain to one-third more height than in New England. While, therefore, at the north the trees have not been increased, at the south they have been multiplied to a great extent; and of the many thousands of trees which have been offered for sale, and have changed hands the past autumn, two-thirds have been the growth of the middle and southern states.

The high price of the trees, it is thought, by many, is injurious to the cause of the silk manufacture; and that it will deter many gentlemen, farmers, and others from entering into the business.

We think not. The price of the trees is based upon the fact, that there is not yet, in the country, counting every tree of any size, a sufficient quantity to manufacture five hundred thousand dollars' worth of silk, only *one-fortieth* of the consumption of the country in 1836. Supposing, therefore, that the manufacture of silk can be carried on at a great profit, as has been satisfactorily tested, it will be some time before there will be trees enough in the country, notwithstanding their unbounded increase, to feed worms sufficient to manufacture one half the annual consumption of silk. Taking this view of the subject, the trees, at double the prices they are now held, would not be more than their intrinsic worth.

Professedly foreign from our province as the growth of the mulberry tree and the manufacture of silk is, we cannot help expressing our sentiments upon the subject. Whether the mòrus multicaúlis will be the tree *best* adapted to the climate of New England, remains to be tested; but that it is the variety which will afford the best and most profitable food for the worms in the middle and southern states, there is no doubt. Perhaps the Alpine, the Brussa, or the Canton will do better in the severe climate of New England, where large plantations are to be made; at any rate, each and all of these should have a fair trial, and if, from their hardiness, they surpass the Chinese, let them take its place. We shall watch the progress of the cultivation of the mulberry with some attention hereafter, and note down the results.—*Ed. Hort. Mag.*

From the Farmers' Cabinet.

GEORGE HENRY WALKER.

[The following extract is a part of a more extended notice, which was read before the Philadelphia Agricultural Society. Mr. Walker was a highly valued contributor to the pages of the Farmers' Register. If his death had then been known, his name would certainly not have been omitted in our last month's brief allusions to the termination of the lives of several other persons, whose aid was much valued, and of which the cessation will be much regretted.—ED. FAR. REG.]

The name of this gentlmen, by whose sudden death (which took place at his residence, Longford, in Philadelphia Co., on the 7th of Sept. last, in the 50th year of his age) the cause of agricultural improvement has lost a valuable and efficient friend, deserves honorable mention; and the following brief notice has been suggested as a slight tribute to memory of an enlightened farmer and most worthy man.

The pupil of some of the most celebrated agriculturists of the old country, Mr. Walker came hither and settled amongst us about twenty years ago, bringing with him no ordinary degree of intelligence and information concerning his favorite profession. He purchased a farm of about a hundred acres in Philadelphia County, where notwithstanding the discouragements which always obstruct the progress of agricultural reform, he illustrated the value of those improvements which his extensive knowledge and excellent judgment showed him to be desirable and necessary. He was the first to call attention to the relations existing between the laws of subsistence, occupation, and production, and to apply them as a principle to the improvement of agriculture. He was mainly instrumental in introducing a judicious system of root-culture. He demonstrated the importance of the green-crop system, of a better method of preparing and applying manures, and of an alteration in the rotation of crops. The utility of his improvements was shown by their results, and it may truly be said of him, that he made more than two ears of corn grow where only one grew before. He occasionally had under his charge young men of intelligence and character, who enjoyed the advantages of his rich agricultural wisdom and experience, imbibed his ardor, and who, upon farms of their own, are now carrying out his excellent principles of culture, and promising fair to perpetuate and extend the influence of his system.

From the Cattle Keeper's Guide.

METHOD OF ASCERTAINING THE WEIGHT OF CATTLE WHILE LIVING.

This is of the utmost utility for all those who are not experienced judges by the eye; and by the following directions the weight can be accertained within a mere trifle. Take a string, put it round the beast, standing square, just behind the shoulder blade; measure on a foot-rule the feet and inches the animal is in circumference; this is called the girth: then with the string measure from the bone of the tail which plumbs the line with the hinder part of the buttock; direct the line along the back to the forepart of the shoulder blade; take the dimensions on the foot-rule as before, which is the length, and work the figure in the following manner: girth of the bullock. 6 ft. 4 in.; length 5 ft. 3 in.; which multipled together, maks 34 square superficial feet; that again multiplied by 23 (the number of pounds allowed to each superficial foot of all cattle measuring less than seven and more than five feet in girth,) makes 713 lbs. and allowing 14 pounds to the stone, is 50 stone, 13 lbs. Where the animal measures less than nine, and more than seven feet in thegirth, 31 is the number of pounds to each superficial foot. Again, suppose a pig or any small beast should measure two feet in girth and two feet along the back, which multiplied together, makes four square feet; that multiplied by eleven, the number of pounds allowed for each square foot of cattle measuring less than three in girth makes 44 lbs, which divided by by 14 to bring it to stones, is three stones two pounds. Again, suppose a calf, sheep, &c., should measure four feet six inches in girth, and nine inches in length, which multiplied together makes sixteen and a half square feet; that multiplied by sixteen, the number of pounds allowed to all cattle measuring less than five feet, and more than three in girth, makes 26 pounds; which divided by fourteen, to bring it into stones, is 18 st. 12 lbs. The dimensions of the girth and length of black cattle, sheep, calves, or hogs, will be as exact, taken this way, as is at all necessary for any computation or valuation of stock, and will answer exactly to the four quarters, sink the offal, and which every

man who can get a bit of chalk, may easily perform. A deduction must be made for a half fatted beast, of one stone in twenty, from that of a fat one; and for a cow that has had calves, one stone must be allowed, and another for not being properly fat.

ACCOUNT OF THE NEWLY DISCOVERED PREPARATION OF "SHORT-STAPLE FLAX."

Published by the Delaware Manufacturing Company, of Lambertville, New Jersey.

The preparing of flax, of a suitable texture to be spun on machinery similar in its construction to that used in the manufacture of cotton, has been an object long sought after, and the mechanical skill of Europe has been exhausted with abortive attempts to accomplish this object. Various and ingenious have been the attempts to subject this useful article to operations of machinery, so as to reduce the enormous expenditure of human labor, which is now required to bring it into cloth of a fineness to become useful as wearing apparel. In Ireland and other countries, where linen is a material article of manufacture, the most of it is spun by the fingers; besides this tedious expensive method before the flax is in a condition that it can be worked by the hand-wheel, it has lost from three-quarters to seven-eighths of its original weight by the process of hackling, the most part of it being drawn out into tow.

The coarse *linens* that are spun on machinery, are also subject to the same loss of weight, and slow and comparatively imperfect method of spinning. By endeavoring to preserve the staple, the article is obliged to be subject in all cases to the hackle, as the only method by which the fibres can be separated and rendered of a sufficient fineness to allow them to be drawn into a thread. To remedy all these evils, to save this vast expenditure of labor, and also the enormous loss in weight, a late inventor has been led to a series of experiments wich has resulted in the production of an article, at a moderate expense, (not materially exceeding in cost the present price of cotton) that is capable of being converted into cloth of any texture, by the same process as cotton; thus bringing the cost of linen goods on a level with cotton.

We remark that it is our belief that a revolution is about to take place, equal if not parament to that produced by the invention of the *cotton gin*. Every description of linen goods is of yearly import to a vast amount, while at the same time large regions of our own country have a climate and soil entirely congenial to the production of flax, and it has only been prevented heretofore from becoming a staple article by the expenditure of labor required to make it marketable. By the late invention all these difficulties are abolished, and the material is rendered subservient to the *cheap* action of machinery from the time it leaves the hands of the grower, until it arrives at the consumer's market.

It is not to be expected that there will be any *immediate* reduction in the price of linen goods, as those holding the monopoly will of course convert it as much as possible to their own profit. Experiment has shown that linen cloth now selling in our markets for sixty cents, may be produced at a cost not exceeding twenty-five: by this datum a calculation of the value of the invention, and the profit that must for a long time reward the first prosecutors of the enterprise, may be easily made.

The Delaware manufacturing company of Lambertville, New Jersey, have contracted with the inventor, for the exclusive right of the invention for the state of New Jersey, at a price to be fixed by competent disinterested persons after the value of the invention is ascertained by experiments on an extended scale. Three hundred shares of the capital stock has been subscribed, and fifty dollars have been paid, amounting to fifteen thousand dollars, which amount, with debts which the company owe to the amount of four thousand dollars, has been invested in machinery and material; this machinery now in the hands of the company, is capable of turning out 1500 lbs. of lint per day, and is at this time in operation. In order to enable the company to carry on their operations to the *cloth*, it will be necessary to increase the subscription to three thousand shares, with the payment of five dollars on each share. By a resolution of the board, no further payment will be demanded *unless by the consent of three-fourths of the stockholders*. This amount of capital will enable the company to throw a quantity of the article into the market, and it is believed that the cloth produced after a short experience, will command a price equal to imported linens. We will here call the attention of the public to the advantages which the country must derive in a commercial and agricultural point from the success of the *short staple system* of working flax. Large regions of our west and north west, are admirably adapted to the cultivation of flax, and must, in time, rival the south with an article of export, and at the same time we shall save a vast amount of capital sent to Europe yearly to pay for this indispensable article.

It is the intention of the company to confine its operations to the *preparing of flax*, like the accompanying samples, to be sold to manufacturers who have the necessary machinery for converting it into cloth.

It is believed that, as soon as a number of the cotton spinners of this state, have changed their operations from cotton to linen, others will be induced to follow—and consequently a large demand for the material manufactured by the company. The company will of course find it for their interest to sell rights in other parts of the state, and the profits to arise from this course, as soon as the advantages are known, will be to a *great amount*.

The advantages to be derived from the short staple system for manufacturing flax, are as follows:

1. There is no loss of the fibre, as no tow is required to be taken out—all the lint is converted into linen of the finest quality.
2. The expense of labor required to convert it into cloth, is reduced to one-tenth the former cost.
3. The expense of bleaching in the flax is much less than in the cloth, and is not so liable to be injured in the process.
4. The operation of bleaching in the cloth takes from it a considerable weight of glutinous matter, and consequently leaves the goods open, and the thread soft-twisted. On the other hand by the *short staple* system, the glutinous matter is extracted before it is spun, and the thread will of course remain much more solid.

Having thus briefly stated the object and prospects of the company, we will here remark that, after considering all the advantages which the company derive from their contract with the inventor, (giving them the entire control of the state of New Jersey, which produces a larger quantity of flax per year than any five states in the union together,) the profit to share-holders must be very great.

Extract from sketches of the Upper Wabash Valley, by H. W. Ellsworth.

"For the purpose of ascertaining whether flax could be raised with advantage on the western prairies, Mr. Schermerhorn visited one of the largest flax manufactories in the United States, conducted by Mr. Sands Olcott, at New Hope, Pennsylvania. The results of that investigation will be found in the following letter, together with a description of the short staple we have mentioned:

New York, July 28, 1838.

"*Dear Sir*—Agreeably to your request, on my return from Washington city, I visited Mr. Sands Olcott, of New Hope, Pennsylvania, the gentleman who has discovered a method of preparing the short staple flax, (of which you showed me a specimen at the the Patent Office,) so as to make it into linen on the common cotton machinery now in use. It is, indeed, a beautiful and valuable article, having such a fine gloss or silky appearance, that most persons mistake it for raw silk. The introduction of this article will be of great importance to our country, and will produce a great and profitable change in our manufactories. I found Mr. Olcott very ready to communicate to me such information as I was in search of, in reference to the cultivation of flax, and manufacturing it into his short staple, with a view of ascertaining whether the raising of flax can be made profitable on our western prairies.

"From the information I have received, I have no doubt that linen of as good quality can be made from the short staple prepared by Mr. Olcott, as has been made by any method heretofore pursued. I know it may be conjectured that, by separating the fibre and bleaching it, in preparing the short staple flax, the linen made from it will not be of as good a quality as that made in the old way. But if you will go to the trouble of taking a few threads out of any piece of linen, and untwist them, and then pull them to pieces, you will find you have the same kind of article from it that Mr. Olcott calls his short staple flax. From this it appears to me that, by the ordinary process of water or dew-rotting, breaking, swingling, hatchling, spinning, weaving, and bleaching, the fibre of the flax, when manufactured into linen, in the common way, undergoes the same change in separating the gluten from it that is effected by Mr. Olcott, by a short and speedy process, before it is made into cloth. Indeed, I think it will make a better and firmer linen, because the gluten is perfectly separated from the fibre before it is woven; whereas, by the old method, much of the gluten remains in the fibre after it has been water and dew-rotted and manufactured into cloth, and which is separated by bleaching. Consequently, according to the quantity of gluten separated from the cloth, it becomes loose and open, though this defect the manufacturer studies to disguise by starching. From experiments already made, Mr. Olcott is satisfied that his short staple flax can be manufactured into linen, on common cotton machinery, as easy and cheap as cotton shirting can be made of the same quality. I mean now only as to the price of spinning and weaving per yard. If this be so, the flax crop will become of as much importance and profit to the farmers and manufacturers of the northern states, as the cotton crop is to the southern states; for the difference between linen and cotton cloth of the same quality, is about as one to four, or twelve and a half cents to fifty in favor of linen, while the flax crop can be raised in half the time, and with less than half the expense of a cotton crop. This discovery of Mr. Olcott will make as great a change in the linen trade as the invention of Whitney's cotton gin did in the cotton trade; and must, in a short time, greatly increase the demand, and enhance the value of prairie lands, in Indiana, Illinois, Missouri, and Wisconsin, which are admirably adapted to the cultivation of flax. Indeed, I have seen a wild flax, resembling our common flax, grow spontaneously in the prairie. Farmers settled on the prairies of the west will do well to turn their attention to the cultivation of flax, as one of the most productive crops they can raise. The lands in New Jersey and Pennsylvania, in the vicinity of New Hope, as an average crop, yield one ton to the acre of the stem, which sells readily at $12 per ton; and it is fair to calculate the flax-seed worth at least as much more from an acre, which will amount to $24, the avails from an acre of flax. This, the farmers here consider doing a good business. However, in our rich prairies of the west, we can raise from one and a half to two tons per acre, as easily as they raise one in New Jersey; and by sowing our seed the first crop on the prairie sod, we shall have no weeds for some time to contend with. Instead of being under the necessity of pulling our flax by hand, we shall be able to reap it with our mowing machines, and this will enable our farmers to raise very extensive crops, from which they will realise great profits.

"Mr. Olcott informed me, that in his flax establishment at New Hope, he works up about 3,000 tons of flax in the stem per year; and that this will produce about 430 tons of his short staple flax; that is, it takes seven tons of the raw material to manufacture one ton of short staple fine flax. The expense of manufacturing the fine flax, including the price of the raw material, is about $250 per ton. The expense of making this fine flax into fine linen, will be four cents a yard for spinning, weaving, and putting it up ready for market. This calculation is made on the supposition that prices for spinning and weaving will be about the same as that of cotton. In the above estimates, however, nothing is included except the expense of the hands that do the work. The interest on the capital invested, the risks on the building, and wear and tear of the machinery, are not taken into the account.

"I deem it very important for the interests of our country that linen factories should be established; and if the profit arising from this business was generally known, I have no doubt capital to any amount could be raised to carry them on very extensively. As I take a deep interest in this matter, I have endeavored to obtain all the information I could on the subject, with a view of calling the attention of capitalists to this branch of

business. I will now give you briefly the sum of the matter:

"1. Estimate for buildings and machinery to manufacture 1,000 tons of short staple flax per year, according to information derived from Mr. Olcott, will cost about - - - $30,000
"The actual expense of preparing 1,000 tons, including the expense of the raw material, at $250 per ton - - 250,000

$280,000

"Now let us estimate this fine flax worth fifty cents per pound, which will not be deemed an extravagant price, when it is considered that every pound of flax will make from four to five yards of cloth, say four yards, and that this can be manufactured at *four cents* per yard. These 1,000 tons, being 2,000,000 pounds, will be worth, at 50 cents per pound - - - - - $1,000,000
"Now deduct from this, as above, for buildings, machinery, raw material, and expense of manufacturing the short staple flax, - - - $280,000

"Which leaves a profit, after paying for building and machinery - $720,000

"2. Estimate for manufacturing the short staple into fine linen. I have been informed, by gentlemen engaged in cotton factories, that it is considered a fair and safe estimate, in establishing cotton factories, that every loom you put into operation will cost $1,000. This includes all expense for site, buildings, machinery, &c. A power loom, to go into complete operation, it is estimated, will turn out 30 yards of cloth a day. Then to manufacture 1,000 tons of fine flax, being 2,000,000 pounds, which will make 8,000,000 of yards, you must have in operation about 850 looms, which, at $1,000 each, give - - - $850,000
"For spinning 2,000,000 pounds, at 8 cents per pound - - - 160,000
"For weaving and putting up 8,000,000 yds., at two cents per yard - 160,000
"For 1,000 tons or 2,000,000 pounds of short staple flax at 50 cents - 1,000,000

"The whole expense of buildings, machinery. labor, and stock, for producing 8,000,000 yards of fine linen, is $2,170,000

"If we estimate this linen at fifty cents per yard, then 8,000,000 yards, at fifty cents, is $4,000,000
"Deduct for buildings, machinery, stock, and labor, - - - $2,170,000

Which leaves the net proceeds - $1,830,000

"Now, according to the above estimates, the farmers on the western prairies would make from a flax crop at least from $25 to $30 per acre from their land, which cost them only $1 25 per acre.

"The manufacturers of the raw material into the fine short staple flax, would make between two and three hundred per cent. on their capital invested in this business.

"And the linen manufacturer, after paying for all his buildings, machinery, stock, and labor, would clear nearly one hundred per cent. the first year; and after that his profits will also be between two and three hundred per cent. on his investments. From this it is evident that linen might be manufactured and sold from fifty to one hundred per cent. below the above estimated prices; and yet, all engaged in this business make it a very profitable operation. This would be a great saving to the consumers of this article. But this is not the only advantage the country will derive from the introduction and manufacture of the short staple flax; for we shall have introduced a new staple, admirably adapted to be combined with other staples, particularly that of silk. This will greatly aid the silk manufacturers of our country, and enable them soon to furnish a considerable quantity of this new and very substantial article for wearing apparel for the use of gentlemen. If our farmers and manufacturers were to turn their attention to the cultivation of flax and manufacture of linen, and of a silk and linen fabric, it would not only be very profitable to themselves, but annually save several millions of dollars to our country, which we now pay to other nations for linens and silks. This subject is certainly worthy the attention of every man who has the best interests and prosperity of his country at heart; and I hope it will claim the attention of the farming and manufacturing interests in the states most interested in this business.

"I have given you my views freely on this subject. They have been drawn up hastily; let them pass for what they are worth, and make what use of them you please.

"I am, with great respect, your friend, &c.,
"J. F. SCHERMERHORN.

"HON. H. L. ELLSWORTH.
Washington, D. C."

"We are aware that objections may be raised to the sum of fifty cents per pound for the "short staple;" though that price might be sustained by reference to the present cost of linens.

"The short staple, however, can be prepared at about $250 per ton, and afforded at twenty-five cents per pound, giving an immediate profit of one hundred per cent. Allowing it to be bought at this price, it could be manufactured into linen and sold at twenty-five cents per yard; yielding, in this shape, to the manufacturer, a further profit of one hundred per cent., as his reward."

It is found by experiment, that one acre of good land will yield a bale (or four hundred pounds) of cotton, ready for the market; and it is believed a similar amount of the short staple may be raised upon an acre of the western prairies. The calculation is as follows: Seven tons of the flax in stem are required for one of the short staple. At the rate, therefore, of one and a half ton, or 3,000 pounds) of the stem per acre, it will be found that each acre will produce four hundred and twenty-eight pounds of the short staple; a fact, exhibiting conclusively the future value of the prairies, should the culture of flax be generally adopted.

In many portions of our country, especially in New Jersey and New York, flax is raised with reference to the seed alone, and the lint is thrown away.

Mowing flax has been resorted to by many farmers, in preference to the tedious and expensive modes of pulling, heretofore in use. This, however, is a process which always leaves the stem entangled and difficult to break. In the new me-

thod of reducing flax to a fibre resembling cotton, it is believed that less care in gathering will be required; especially if the "brakes" are improved by the addition of transverse rollers, to crush the stem, in whatever position it may be presented.

From the Franklin Farmer.

THE SHORT-HORN FEVER.

Mr. Editor:—In a recent number of the Genesee Farmer, in an article headed "Kentucky Farming," the editor expresses the belief that "*the short-horn fever in the west, like the mulberry fever in the east, must be near reaching its crisis.*"

Although I will cheerfully accord to the able editor of that excellent paper a general correctness of opinion, yet I can but express my entire dissent to the above sentiment, in which, I humbly think the editor, has for once been vastly mistaken. He intimates that the demand and sales of the short-horns in the west is the effect of a *mania;* and is out of proportion to their value. Does he not know that at all the numerous Fairs in the west (the extensive reports of which he has seen,) the merits of these animals have been the subject of most rigid scrutiny; and that without a single exception they have carried off the palm? Does he not know, that for several years past, we have placed them beside our scrubs in the dairy, the slaughter house, and the feeding lot, and that their intrinsic merit and superior excellence have thus been proved beyond the possibility of a doubt?

So obvious and decided is the superiority of the improved short-horn over the scrub cattle, all things being considered, that it seems to be the fixed determination of every intelligent farmer in the west, to possess them, so soon as he can procure money to purchase, and grass to pasture them. In this they proceed upon an invaluable principle which should always be observed: *Keep no stock but the best of its kind.*

Hitherto these animals have been restricted to small districts in Kentucky, Ohio, and Tennesee, but more recently have been turning from these districts as common centres, with their heads and footsteps directed to every possible point of the compass. See the vast extent of territory which is rapidly preparing for and calling for these valuable animals. Illinois and Missouri are throwing enclosures around their vast natural pastures, (with a rapidity almost rivalling magic itself,) soon to be grazed by the best cattle which can be procured. Indiana, although inclined to a diversified husbandry, is rapidly acquiring a taste for grazing and good cattle. Tennessee is opening her eyes to a soil exhausting by cotton and tobacco, and sees in the growth of the blue grass, and the pasturing of cattle, the means of restoration and riches, and is even ordering the short-horns from England. Ohio and Kentucky themselves are not half supplied with this valuable commodity; and to say nothing of North Alabama, Arkansas and Wisconsin, the above states embrace a territory, (by reference to the Gazetteer,) of more than two hundred and thirty thousand square miles yet to be supplied with this excellent race. Allowing only one short-horn to the square mile, the stock we now have to breed from could scarce supply the demand in twenty years. So rapid has been the progress of improvement in the west, that for several years past we have not been able to produce a sufficiency of through-bred bulls to cross the common stocks with. Hence, so far from declining, the price of blooded cattle in Kentucky has steadily advanced, even through the pecuniary crises of the two last years; and is still advancing, notwithstanding the unfortunate death of several of the principal breeders in Kentucky, and some other circumstances, have combined to throw an unusually large number into market during the last summer and fall; and notwithstanding the general shortness of the crops.

I have heard that a cow sold in this section last month for $2000. She is not bad property at that price, for her last calf, though a bull, and only a few months old, sold for $800; and her next will most probably be worth as much. Nor could the calf be dear, for even in a herd of 20 *common* cows he would pay for himself in four years, every half blood calf being worth $10 more than a scrub calf (other things being equal) even for beef.

If there is any propriety in the foregoing calculations, the *mania* for the short-horns, so far from reaching its crises, is yet far, very far, from its climax. So confident am I in this belief, that this year, I have sold only about $1000 worth of stock, while I have bred nearly forty cows to a through-bred bull. The short-horns for years to come must spread through the country southward and westward, and the price for them will be still onward and upward. Let not these who wish to purchase, delay, under the vain expectation of a reduction in price, or they, like myself, may have to rue it, to the tune of many hundreds.

Yours respectfully,

A KENTUCKY FARMER.

From the Lexington Intelligencer.

SALES OF DURHAM CATTLE.

We learn that Henry Clay, Jr. Esq., has sold his imported improved short-horned Durham cow, Princess to John and Richard Allen, Esqrs., of this county, for $2,000; the highest price ever given for a cow *in* the United States.

At the sale of Thomas Smith, Esq., last week, the improved short-horned Durham calf, Grosvenor, two years old, by Talleyrand, imported by the Ohio stock company, was purchased by Thos. H. Clay, Esq., for $700.

As the vast improvement in the size and beauty of our stock, effected by the introduction of the Durham breed, has become more extensively known and appreciated, the pure blooded animals of this race have increased in value; and probably will continue to do so, until the supply is equal to the demand. Such has been the anxiety of stock raisers, not only of this county and state, but throughout the west, for a few years past, to possess themselves of through-bred Durham breeders, that the multiplication of the race has borne but a small proportion to the number of purchasers in the market. This will doubtless continue to be the case for a number of years. Fayette county was, we believe, the first place in the west where the improved short-horns were introduced, and, although several of our farmers have, for a number of years, been investing their capital, in

the business, their sales have been so rapid, that few if any of them, have more of through-bred animals on hand, than are necessary for their own immediate purposes. That the business has been a source of considerable profit to them, and will continue to be so, cannot be doubted; but they have not received more than a just reward for their enterprise, and the care and attention they have given to the important subject of improving our breeds of cattle. It is a matter in which every farmer, and posterity, are deeply interested. As a mine of the richest ore is more valuble than one which contains nothing but the meanest metals, so is an agricultural country, stocked with the finest breeds of domestic animals, wealthy above that which possesses none but the unimproved scrub races.

The cow above stated, purchased by Mr. Allen, is one of superior form and size; the calf, we have also been told by good judges of stock, has rarely, if ever, been exceeded in appearance by one of his age.

ON THE PROPAGATION OF SILK-WORMS.

To the Editor of the Farmers' Register.

I have read with pleasure and profit, the essays of Mr. Gideon B. Smith, on the culture of silk, recently published in the Farmers' Register. But there is an objectionable passage in No. 2 which I hope Mr. Smith will consent to alter or suppress, when the essays shall be published in pamphlet form.

The language used about the writers of a polite, hospitable and scientific people is uncourteous, and the theory maintained erroneous, and calculated to do harm. I should not use such positive language, if I had not investigated the subject with unusual care.

I will now contrast the passage from Mr. Smith's essay with quotations from the Chinese and French writers and the result of my own experience since the spring of 1836.

Mr. S. says "the recommendation of the French to separate the moths after they have been coupled *six hours*, is perfect nonsense, and is one of the ridiculous refinements that refined people have tried to apply to the silk-culture, without the shadow of utility to recommend them, and only remarkable for the great additional labour and perplexity with which they encumber the business. Like all the other *fooleries* of the French, I tried this, and got for my pains no other result, than a loss of about one-third of my eggs, which *were not fecundated*, as might have been expected. Let the moths remain together until they separate of themselves, and all your eggs will be good."

Nothing it seems to me, short of *infallible certainty* can justify the spirit and turn of this quotation; and to arrive at such certainty it is obvious that more than one or even two experiments are requisite. The subject is too important to be despatched in this hasty and peremptory style. It will appear from one of the following quotations, that Mr. S.'s failure to get good eggs may be accounted for without pronouncing a practice sanctioned by the combined experience of France, Italy and China, to be "*perfect nonsence*" and a a ridiculous foolery.

"The moths which come out the first day are called *grass-moths*. The last of all, are called *mo-gno*, (that is to say: the last butterflies.) Neither of them ought to be kept. Only those which come out after the second day should be taken. The sheets of paper must be spread upon the cases of a shelf, then the males and females come close together and copulate. *When the evening comes, the male butterflies must be taken away*, and the females placed on sheets of paper, leaving an equal distance between them. The eggs which are found in lumps ought to be thrown out."—(*Chinese Treatise on the culture of silk, published by P. Force.*)

"After the cocoons have been taken down from the hedge, those which are intended for eggs, should be laid, but not crowded, on tables, that is to say, the males on one table and the females on another, that they may not copulate two soon, and before they have discharged a *viseid humor*, of a yellow reddish color, *which prevents their fecundity*. They discharge this humor in one hour after they come out of the cocoons."—(*Essays on American silk, by J. D. Homergue.*)

I have practiced the method described by the Chinese writer, five times, and have uniformly had the eggs well fecundated. The eggs may fail to become fecundated, not only for the *viscid humor* mentioned above, but also by delaying the union until the eggs are formed, and the females are ready to deposit them. Copulation may take place after this, but it will avail nothing. The moths usually come out of the cocoons between sun-rise and 10 A. M. Those which copulate about that time, should be spread out in pairs, where they cannot be disturbed by males seeking union with the female, until 4 P. M. The males must then be taken away, and the females left quietly to deposit their eggs.

The energy of the males is far from being exhausted when the females are satisfied, and if not taken away, such is their anxiety for re-union, that the females will be harassed, and confusion and disorder will be the consequence. Such at least, has been my experience; let others examine the subject carefully, and report the result of their observations.

Your ob't servant,

LAYTON Y. ATKINS.

Stafford County, Va., Dec. 31st, 1838.

From the Farmer's Magazine.

BEGINNING OF MARLING AND LIMING IN ROXBURGHSHIRE, SCOTLAND.

Marl was first applied, as a manure, in Roxburgh, by Lord Minto, as a proprietor, and by Mr. Dawson, as a farmer, about the year 1753; the former using his own shell-marl, which was not then to be had for sale, and the latter clay-marl; the former at the rate of 30 carts, the latter at the rate of 330 carts per acre. So soon as roads of communication were opened, lime immediately superseded the use of clay-marl (of which such enormous quantities needed to be applied;) though the county yields no lime, and the distance to it extends from 16 to 30 miles. Since the year 1772,

shell-marl has been exposed to public sale; and since it was thus procurable by farmers at large, its application is becoming more general. From 20 to 25 carts, such as already specified, are given to the acre, of this shell-marl, in a dry state: it loses, in drying, a fifth of its bulk wet from the pit. The effects of marl are observed to be not immediate, but lasting: crops from marl are a fortnight later in ripening than those from lime, and the grain of less weight by one-tenth, in equal measure.

Lime is rather preferred even to shell-marl, its quicker operation suiting better with the short tenure of a tenant's possession. It is applied at the rate of six carts to the acre, in light soils; and of eight, ten, or sometimes sixteen, in clay soils.

From the Magazine of Horticulture.

THE ROHAN POTATO.

This celebrated potato will be very extensively cultivated the coming season. It is one of the most extraordinary varieties for productiveness ever known; nor are its eating qualities inferior. Though not held up to be equal to the forty-fold, the Mercers, and other well known kinds for the table, they are, nevertheless, equal, if not superior, to many of the potatoes which are to be found in our markets. For stock there is probably no crop that can be raised more productive. Twelve hundred bushels to the acre can probably be grown, if the statements of Judge Buel and others can be relied on, who have raised them. During the past dry summer, side by side with other kinds of potatoes, the produce was as ten to one. The severe draught affected the crop in a great degree, yet the produce was immense. St. Helena potatoes, a variety in considerable esteem, did not produce a crop that would pay the expense of digging, in the same ground where the Rohan afforded thirteen pounds to one planted. In our notices of vegetables, which will appear in our next number, we shall add some additional facts, relative to their growth, produce, and importance to the farmer.

From Loudon's Gardeners' Magazine.

CROSS FECUNDATION OF PLANTS.

The effect of the preceding winter on hybrid plants has led to some interesting results respecting cross fecundation. It is known to scientific gardeners, that, in the case of hybrids generally, the progeny takes the constitution of the female parent, while its characteristic features are those of the male. Hence, it might have been foreseen, that a cross between *Rosa semperflorens* and the Ayrshyre rose, the latter being the female parent, would produce a much hardier progeny, than if the crossing had been reversed. It might also have been anticipated, that a cross between the tree rhododendrons of Nepal and the *Rhododéndron pónticum* of the temperate parts of Asia, the latter species being the female parent, would produce a much more tender progeny, than a cross between the Asiatic tree rhododendrons and those of North America, the latter being the female parent. Hence, we are able to account for the apparently anomalous circumstance of some of the Bengal hybrid roses having been destroyed altogether by last winter's frost, while others have been only partially injured; and hence, also, we discover the reason why the progeny of *Rhododéndron catawbiénse*, *Rhod. máximum*, *R. caucásicum*, &c., fecundated by *Rhododéndron arbòreum*, have stood the last winter, scarcely, if at all, injured; while the progeny of *R. póntícum*, fecundated by *R. arbòreum*, has invariably been killed down to the ground, or totally destroyed. While the loss of some hybrid arbutuses is to be accounted for on this principle, the mode of producing, by cross fecundation, a number of others which shall be nearly as hardy as the common species, is clearly pointed out. In short, the confirmation of the general principle, that, in cross fecundation, the constitution of the female parent prevails in the progeny, is, we think, the most important gardening feature that has transpired during the past year.

It has long been known, that, among plants raised from seed, whether the parent has been cross fecundated, or otherwise, there is frequently considerable constitutional difference in the progeny; some being hardier than others, and some being earlier or later than the average of the species, of coming into leaf or flower. These differences in seedlings may be seen on an extensive scale, in every hawthorn hedge and oak wood; and, in a more limited way, they are exhibited in seedlings of different sorts of evergreens, such as the arbutus, *Quércus Ilex*, Portugal laurel, *Magnòlia grandiflòra*, *&c.* The causes of this difference never have, and, probably, never will be, discovered; but, nevertheless, any facts which bear on the subject are worthy of record. Thus, it has been found that the severe frost of last winter produced a much more injurious effect on the narrow-leaved varieties of *Rhododendron ponticum*, such as *R. p. salicifolium* than on the varieties with broad leaves. The same remark applies to the narrow-leaved varieties of *Magnolia grandiflora*, *M. g. lanceolata* having had the foliage more injured than any other variety.

It is worthy of remark, that all deciduous trees and shrubs of the colder parts of North America, that had ripened their wood, have escaped wholly unhurt; while some natives of Siberia, such as *Lonicera tatarica*, though, when in a dormant state, they are capable of resisting the most severe cold of the British winter, were, from being in a growing state when the severe frost suddenly took place, severely injured. Even the evergreen magnolia of North America, *M. grandiflora*, in places where it was exposed as a standard tree, in the free air of the climate of London, only had its leaves injured, and that, in most places, but partially; the buds having broken out in the course of the summer, in every case that we have seen or heard of. On dry gravelly soil, in Hertfordshire, such as at Totteridge and Cheshunt, even the leaves of standard evergreen magnolias have escaped without the slightest injury; thus placing the hardiness of this fine tree beyond all doubt. Most of the beautiful species of *Mahonia* (evergreen berberries), from California, have also stood the winter, without their beautiful foliage having sustained the least injury. *Garrya elliptica*, an evergreen from California, proves to be of the same degree of hardiness as the common laurustinus. *Aúcuba japonica*, like many

other Japan plants, ligneous and herbaceous, proves to be quite hardy. *Wistaria sinensis*, *Magnolia conspicua*, and *Illicium anisatum*, from China, and *Chimonanthus fragrans*, from Japan, are also as hardy as any of our natives, and will, in consequence, in all future time, prove conspicuous ornaments in British gardens. The lesson which the young gardener has to learn from these facts is, that it is not enough for him to know the general principles of plant culture, as taught in books, and practised in British gardens; but that it is nearly equally necessary for him to have a knowledge of the geographical range, and of the soil, and the elevation above the sea, as far as these can be obtained, of every foreign plant which is committed to his care.

From Loudon's Gardener's Magazine.

BREAD WITHOUT YEAST.

A baker in London has just taken out a patent for the manufacture of a light bread, the qualities of which depend neither upon leaven nor yeast. He substitutes for these materials bicarbonate of soda and hydrochloric acid, in such quantities as to enable the acid to combine with the soda, and thus form common salt; while the carbonic acid is disengaged, swells the dough, and gives it that spongy appearance which characterizes light bread. The following is the manner of operating:—

To 7 lbs. of wheaten flour mix from 350 to 500 grains of bicarbonate of soda, and nearly a bottle and a half of distilled water. In another vessel, the necessary quantity of acid (420 to 460 grains of muriatic acid of the shops are, in general, necessary) is mixed in about half a bottleful of water. It is indispensable to dilute the dough well with the solution of soda; and, when all is well prepared, the acid is poured on it. Pastry may be treated in the same manner. The quantity of bicarbonate used varies with the degree of lightness required for the paste.

From the Journal of Commerce.

BROOMS.

A cargo of corn brooms has been landed here during the last week, from George-town, D. C. Messrs. Geo. C. Mason & Co., have established a factory there, capable of turning out a thousand a day, and they have already obtained sufficient attention to the matter by the farmers in the neighborhood to furnish them with great quantities of corn of a fine and long fibre, surpassing, it seems to us, that which is grown under the most favorable circumstances at the north. The brooms are very neatly manufactured, so that any young lady might well be proud to be seen every day with one of them in her hand. We are glad to see the rivalry of the south against the north in some of these Yankee notions. Besides, we do not know that there is a more appropriate place in the country for an establishment of this kind, than the District of Columbia; for there, more than elsewhere, a thorough sweeping out is often requisite, in order that affairs may be kept in tolerable order.

From the Southern Agriculturalist.

CORRESPONDENCE AND REPORT ON THE DEFECTS CAUSED BY BAD MANAGEMENT OF FINE SEA-ISLAND (OR LONG STAPLE) COTTON.

Charleston, S. C. Sept. 21*st*, 1838.

Messrs BROWNS & WELSMAN,—

Gentlemen:—We beg to direct your attention, and that of your friends, who are growers of fine sea-island cotton, to the subject of the annexed letter, addressed to our friends in Manchester, by a highly respectable house engaged in the fine spinning trade. We are all aware of the objecable feature in fine sea-island, of which not only the above house, but also all the other fine spinners have repeatedly complained; and we trust you will agree with us in deeming the subject of sufficient importance to be submitted at once to the notice of our planters. Their known skill and perseverance may devise some means of abating, if not removing altogether, the evil pointed out. Accompanying the annexed, we have samples of the different styles of preparation, from the most faulty to that which is referred to as a specimen of the perfect; and we invite you to call and examine them. Requesting you will aid us in giving circulation to the annexed.

We remain very respectfully, your obt. svt's,
GOURDIN, MATTHIESSEN & Co.

Manchester, (Eng.) August 2, 1838.

We have often, in conversation with you, expressed our regret, that the growers of fine sea-islands, in so many instances, injured their cotton, by stringing and matting it in the getting up; and in hope of drawing their attention to the subject through the medium of your house, we beg to trouble you with the following observations.

Fine cotton yarn is esteemed in proportion as the thread is uniform in substance, free from lumps, and strong. The latter has been decidedly improved by the introduction of the select seed cotton, but the levelness of the thread has been impaired rather than otherwise, and this arises from the multitude of small white specks, or nitters, with which the staple of the finer and softer kinds of sea-islands, and the select cotton seed particularly abounds.

In examining these nitters through a microscope, we find them in general composed of kinds of fibres, presenting an appearance much resembling the misletoe plant in this country, and for some time, we feared they were excrescences peculiar to the fine fibre, and inseparable from it; but the two recent samples of beautifully fine select seed cotton, sent us by you, are so free from this defect, that we have now a strong impression they are chiefly produced by an *overhandling* in the getting up; at least, we can multiply such nitters here, by mismanagement in the cleaning process; and, we have no doubt, the same effect is produced in America. We would, therefore, strongly urge the planter's attention to this point; for, in all cotton goods, such as gauze, muslins and laces, it takes immensely from their value

and beauty, and limits the use of the finer yarns, which are chiefly used for these articles. As an instance of this, we may state, that one of our customers informs us, he frequently pays from 9*d.* to 1*s.* per yard, upon his finest muslins, for picking out the nitters, one by one with a needle, after the goods were woven—an expense which is equal to from 10*s.* a 30*s.* upon each pound weight of muslin. Our experience has proved that the softer and more silky the staple, the more easily it is nittered; and, as the spinners possess no means by which nitters can be removed from the cotton when once formed, the only means of remedying the evil, *is to prevent their formation.*

To this point, therefore, the attention of the grower should be strongly directed. *All unnecessary handling, whipping, tossing, or shaking of the cotton*, ought to be avoided. It should be as well cleaned as possible, but yet *free from stringiness*, and the fibres be left in the loose and disentangled state they appear in when just separated from the seed. If this were attended to, it would materially improve the appearance of fine yarn, and remove the never ceasing complaints of the fine muslin manufacturers, and we are persuaded, tend to increase the consumption of fine cotton goods.

Any reform you can bring about in this matter will be a benefit to trade, and oblige,

Yours, &c. ———

The committee, to whom was referred the letter of a respectable house in Manchester, England, engaged in the manufacture of fine sea-island cotton, respectfully report, that the matter to which their notice has been directed, is one of deep importance to the grower of that valuable staple production. If, in consequence of his neglect, or want of skill, a pound of muslin, which would otherwise command its full price, is depreciated from 10 to 30 shillings, duty and interest obviously impel him to the providing of a remedy at once prompt and efficient.

Through the politeness of Messrs. Browns and Welsman, three samples of cotton, being specimens forwarded from Manchester, were received from Messrs. Gourdin, Matthiessen & Co. These samples are endorsed as follows:—"No. 1, illy got up and nittered," "No. 2, illy got up and partially open," "No. 3, well got up." In examining the "nitters" in No. 1, through a microscope that magnified one thousand times, they were discovered to be, in general, of a globular form, and to consist of filaments of cotton, with interstices of various diameters, readily reducible in size, by pulling the long threads attached to the mass. This, however, could not always be done, as the knot of fibres, constituting the nitter, was, in many instances, too strongly formed. The committee next proceeded to the examination of samples of seed cotton. In about a pound, personally gathered by one of them, from *fully matured* pods, produced from *healthy* plants, no nitters were observed. In the same quantity, picked from *diseased* stalks, which bore *defective* fruit, several were seen. These were subjected to the test of the microscope, and precisely the appearance that characterized those taken from the ginned cotton in No. 1, was exhibited. Repeated inspections since, have produced no marked variation in the general results. The committee, therefore, with confidence, deduce the inference, that preparation, except perhaps in the isolated instance hereafter to be noticed, is not the cause of the nitter. In confirmation of the opinion, putting aside the conclusive facts adduced, the different processes through which the cotton passes, whilst in the hands of the planter, need only to be briefly adverted to. After the stained is separated from the white, the latter is thrown, in small parcels, into a whipper, in order to extract the dirt and to throw off the short and weak fibres, which, if allowed to remain, would detract very materially from the value of the crop. This machine, constructed of wood with round wooden teeth, is turned by the hand. Unless the door of the whipper be closed, which is never done, the egress of the cotton is quickly effected. After this operation, the cotton is ginned and then taken to the moting house, where, on a frame of wood work, it is gently shaken and partially opened by the hand. When clean, it is received by the packer, who, with a wooden instrument, compresses it into a bag, weighing, when finished, from 300 to 400 pounds. In these various, but necessary, modes of treatment, in not one of which any violence is used, the committee feel persuaded, that the staple sustains no injury whatever. It is well known that every description of cotton, except the finest qualities of sea-island, before it is converted into fabrics, is subjected to numerous operations, all of which are performed by machinery. From the willow, which, by its revolving spikes, tears open the matted masses, succeeded by the scutching machine, in which the cotton is beaten by metallic blades, revolving on an axis at the speed of from 4000 to 7000 revolutions in a minute, other machines with iron fingers, teeth and wheels, follow, so that it may almost be said that, without the aid of human hands, the vegetable wool "is opened, cleaned, spread, carded, drawn, roved, spun, wound, warped, dressed and woven."

Now, although it is represented, that the superior qualities of black-seed cotton are not thus wrongly treated, yet, as they are "opened and cleaned by being placed upon cords stretched on a wooden frame, and then beaten by women with smooth switches," the committee are at no loss to perceive how the complaints of the manufacturers by their own act may be increased. This last mode of cleansing the raw material was very generally pursued by the planter a few years ago. Were he now to resume that ready method of preparing his crop for market, he is satisfied, that whilst his time and labor would be saved, the fabrication of fine goods would be likely to incur an additional expense of no ordinary magnitude. By using switches, it is nearly certain, that the weak fibres are broken into minute parts and with the naturally short and rotten, intermix and become entangled. Although, therefore, the imperfection of staple, which is the special subject of this report, is undeniably common to the cotton plant under peculiar circumstances, the committee incline to the opinion, that that imperfection can be created by artificial means, and from experiments instituted by them, is engendered by the different processes through which the cotton goes in its conversion into cloth, as already particularly described. That the nitter, however, is occasionally formed through the want of foresight on the part of the planter, when his crop, from adverse seasons, or other causes, is defective in texture, is

highly probable. The filaments of unripe cotton, are transparent cylindrical tubes. When ripe, even before the capsule bursts, the tubes collapse in the middle, forming semi-tubes on each side, which give to the fibre, says Mr. Baines, in his able treatise on the cotton manufacture of Great Britain, when viewed in certain lights, the appearance of a flat ribbon, with a hem or border at each edge.* Unripe cotton† is finer than that which has attained its full age, but is deficient in the other essential attributes of a perfect staple, strength and length. Some of the filaments, indeed, are not the eighth of an inch long, and until several days after the opening of the capsule, are found doubled or curled, full of watery and oleagenous particles; the cotton is wet to the touch and is of a brown hue. In this state, unless dried in the sun, it becomes more or less mouldy; the superfluous oil from the seed, which ought to have escaped, is diffused through the mass; the color soon changes; heat is generated; and the staple, originally strong, is quickly perceived to be materially affected. Hence, it is not surprising, that in immature cotton, distinguished, as it is known to be, for its delicacy of texture, variableness in length, and want of pliability, when subjected to the mildest mode of treatment to free it from extraneous matter, the threads should cross and mix with each other; thus forming artificial nitters. Within a few years, the action of the sun, with a view to the desiccation of the wool, has been sedulously avoided by, perhaps, a majority of our planters. The daily gatherings are spread in houses, or under scaffolds erected for the purpose, and thus the drying process, if a few exposures in that way is worthy of this appellation, is conducted. That the practice is radically wrong, for the reasons already assigned, the committee firmly believe. Damp cotton, also, can neither be ginned nor cleaned but with difficulty: this of itself is a serious objection, to which may be added the indubitable fact that, from its too unctuous properties, the floating dust of the atmosphere tends to its discoloration.

From these observations, it will appear, that nitters are either natural or artificial, and that both are primarily to be traced to a defective staple, arising from diseased plants; that the artificial nitter may be generated even by the common method of preparation, unless the cotton be judiciously dried; and that the means to which the manufacturer is obliged to resort, are evidently calculated to bring about the same results.

Of these samples, Nos. 1 and 2, which are "illy got up," are lumpy and stringy, of a deep yellow tinge, and weak and uneven in fibre. The cottons, from which these are taken, it is likely, were never dried: it is still more probable, that they were the product of a scanty harvest. No. 3 is of natural color, open, and, in texture, strong and long. It is necessary here to remark, that the stringy appearance of cotton is not always, or even mainly, the fault of the planter. It arises principally from the same cause to which the nitter is referable; the imperfectness of the staple, or the immaturity of the fruit. This was especially true the last year.

To two considerations, pertinent to the matter under review, it may be proper to advert. In every field, no matter under what sinister circumstances the crop has grown, there are small sections in which the plants come to perfection and bear healthy fruit. From these, the cotton that is picked is marked perhaps by every characteristic of the best staple, yet, almost from necessity, it is thrown into the general bulk. Again, in harvest season, the laborer cannot stop to examine, if he had the ability to know, the variant qualities of the cotton he is engaged in gathering, but promiscuously the bad, the fair and the good, are blended. This is unavoidable. Subsequently the stained is separated from the white, but the weak and strong continue together; a part only of the most deficient of the former, being afterwards detached by the whipper.

On the immediate topic of inquiry, the committee ask leave to conclude with the following suggestions:

1. The necessity of dying cotton in the sun, for three or four hours, as its dampness may seem to indicate.

2. Select seed for planting, not with a view to superiority of staple, but the production of sound cotton. For that purpose, choose from *healthy* stalks those pods that are *fully blown*.

3. The first pickings should be set apart, and not mixed with the general crop. The fibre is weak and short. The same course ought to be pursued with cottons gathered after a storm or much rain.

4. Cotton ought to be thoroughly cleansed before it is carried to the gin. If it be well done, the after-labor will be trifling, and the fault of over-handling avoided. Too much pressure on the roller gives to the cotton a matted appearance; if the pressure is unequal, it will be stringy.

Before closing their report, the committee would offer a few reflections, not irrelevant, they trust, to the occasion. For many years the sea-island crop has scarcely repaid the toil and perseverance incurred in its production. From highly unpropitious seasons, the ravages of worms, and the cultivation of a plant, peculiarly delicate and unfruitful, it may in verity be said, that it is annually a subject of congratulation with the planter, if his necessary expenditures do not exceed his profits. Except 1826, when the exportation was about six millions of pounds, from 1833 to 1835 inclusive, the production was less, by from one to seven millions, than at any former period since 1821.*

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* "The twisted and cork-screw form of the filament of cotton, distinguishes it from all other vegetable fibres, and is characteristic of the fully ripe and mature pod. This form and character the fibres retain ever after, and, in that respect, undergo no change through the operation of spinning, weaving, bleaching, printing, and dyeing, nor in all the subsequent domestic operations of washing, &c. &c., till the stuff is worn to rags, and then even the violent process of reducing those rags to pulp for the purpose of making paper, effects no change in the structure of these fibres."—From the difference between the elementary fibres of cotton and flax, the latter being transparent tubes, cylindrical, and articulated or joined like a cane, it has been incontestibly proved, that the mummy cloth of Egypt was linen.

† By immature or unripe cotton, is meant cotton, that, from unfavorable seasons, &c. &c., is made to open prematurely. The pod, about half the size of the full grown boll, becomes black, and, as soon as it has been hardened by the atmosphere, bursts and discloses the imperfection of its fruit.

From these facts, added to the wonderful machinery, which enable a workman now to perform the work required of two or three hundred men, sixty years ago; the increase of population in those countries, where the finest goods are used, and the decrease in the rates of duties in Great Britain, it was reasonable to infer, that an augmentation of price, in some measure, proportional to the diminished production, would have taken place. From 1821 to 1829, inclusive, when the average export was 11,016,418 lbs, the average price in Liverpool was 19d. From 1830 to 1835 (excluding 1833, the export of which year is unknown to the committee) when the average export was reduced to 8,208,194 lbs., the average price was a low as 17¼d.† The committee have been unable to procure the official account of the exports for 1836 '37, '38. They believe, however, it would be safe to say, that the product of last year, and the year preceding, was over six millions of pounds. Hence, if this be true, the two united was considerably less than the single crop of 1826, and but little more than either that of 1821 or of 1822. The present crop, it is confidently believed, will not exceed, if it eqaul, the last.‡ Although the compromise on the tariff question, in 1833, gave an impetus in the cotton trade and manufacture, which, by a salutary reaction, raised the price of the great product of our industry very considerably; yet, it is nevertheless true, that from meagre harvests, especially in 1836 and '37, over 4 per cent. has not been realized by the planter. The crop of 1821, which was over 11 millions of pounds, brought 21¼*d.*; that of 1836 and of '37, *united*, amounting, it is presumed, to about 12 millions of pounds, commanded only the average price of 25*d.*

The committee are aware that, in consequence of the interest of money, and the profits of capital having fallen almost universally in Great Britain, every branch of industry in other countries, in any wise dependent on the skill, enterprise, or capital of that commercial and manufacturing power, has also suffered. Without adverting, however, to the numerous causes which are at hand, for the anomaly which the statistical information, presented in this report, so clearly establishes, one only of the most prominent the committee would name—the practice of mixing the different sorts of cotton together. There is no kind, except the finer descriptions, says Mr. Baines, which is now confined to any exclusive purpose. The long staple is generally used for the twist or wrap, and the short staple for the weft. In this way, the black seed is made to participate in the changes, which, no matter from what cause, mark the market value of the green seed. This, perhaps, is the strongest reason why a more decided inequality in price, between the fine and superfine qualities of long staple cotton, ought to exist; to which may be added, the variety of uses to which the former, alone or mixed, are applicable. From these considerations, it is apparent, that, in relation to those two descriptions of vegetable wool, the one is really worth from two to three-fold more than the other, instead of from 30 to 50 per cent., which continues to be paid.*

In our unremitted efforts to produce the finest cottons in the world, sad experience shows, that we are engaged in an unprofitable enterprise. It is annually proven, that the cultivator of the common qualities, realizes a much larger interest on his capital, than he who can readily command 70 or 80 cents per pound for his crop. So general is this persuasion, that the raising of hardy and productive plants, without reference to the texture of the wool, is now the main object of our desire.

All which is respectfully submitted by

WHITEMARSH B. SEABROOK,
JOHN JENKINS,
GEORE W. SEABROOK, } *Com.*

From the American Farmer.

MR. INGERSOLL'S PIGGERY.

[We have the satisfaction to publish the following account of the most perfect system of breeding swine, that has fallen under our observation. We have visited the establishment which it de-

*Number of pounds of sea-island cotton exported in

1821	11,344,066	1830	8,147,165
1822	11,250,634	1831	8,311,762
1823	12,136,688	1832	8,743,373
1824	9,525,722	1833	
1825	9,655,278	1834	8,085,935
1826	5,972,852	1835	7,755,736
1827	15,140,798	1836	
1828	11,288,419	1837	
1829	12,833,307		

	Average.		Average.
†1821,	12½ to 30d.	21¼	1830, 11¼ to 20d. 16d.
1822,	10 28	19	1831, 9½ 18 13¾
1823,	11 24	17½	1832, 9½ 18 13¾
1824,	11½ 27	19¼	1833, 10½ 22 16¼
1825,	15 42	28½	1834, 13½ 26 19¾
1826,	10 30	20	1835, 14 33 24½
1827,	9¾ 20	14½	1836, 14 36 25
1828,	10 22	16	1837, 12 40 26
1829,	9 21	15	

2s. 11d. per cwt. In 1821 the duty was six per cent. ad. val.

The table from which the above (to 1833) is taken, was published in 1833, by Messrs. George Holt & Co., of Liverpool. It exhibits the extreme prices of cotton and wool in that place, from 1806 to 1835 inclusive. The statement of prices from 1834 to 1836 inclusive, is extracted from a Liverpool circular, published in January last. The difference between the extreme prices has been assumed as the medium price. What the average price really was, cannot, with certainty, be stated.

‡At a meeting of the Agricultural Society, held on the 12th Nov., it was unanimously resolved, that the members forthwith furnish a statement of the probable product of their cotton crop, which resulted in the average of 64 lbs. per acre. This was intended to be appended to the report of the committee and published. The reported average last year, was 76 lbs. per acre.

* One pound of cotton usually makes 8 yards of coarse muslin, and is then increased in value from the raw cotton, eight-fold. But, if spun in the finest yarn, it is worth 5 guineas, and in 1780, if woven into muslin and tamboured, was worth £15. It may now be converted into a piece of lace, worth 100 guineas.—*Report of the Secretary of the Treasury*, 1836.

The finest quality of sea-island cotton, remarks Mr. Baines, in ordinary state of the market, is worth three times as much as the common quality of the same class, The varieties in quality, in most of the other denominations, is from 20 to 25 per cent., and in none of them is more than 50 per cent.

scribes, and heard with pleasure the explanations of its intelligent owner, upon the different parts of his plan. And from our desire to profit by his experience, we subsequently requested him to give us a written description of his piggery, and the management thereof, which he promptly furnished, in a letter that invited us to pursue our inquiries; and these procured for us the more ample details contained in his second letter. It was our wish to publish these communications soon after they were received, but we could not obtain his express permission to make that use of them; therefore, we have withheld his letters from the press until the present moment when we are assured that the cause of his reluctance has ceased to exist; and that his plan may now be made public, without any prejudice to his interests, or violation of his wishes. This system challenges our admiration, and we cheerfully render it to his head and heart. How few of us take equal care of superior animals! And there are not many who carry equal method into their most important avocations—errors, which may justly be ascribed to defective education. It is easy to perceive in every part of Mr. Ingersoll's proceeding, that confidence which merchants feel in the employment of capital at some risk, and heavy charges, for the production of a probable and fair, although remote profit, through a definite channel. With such hopes and calculations, education had made him familiar, whilst it gave him habits of critical investigation that must ever secure to their possessor eventual success in any occupation to which he may devote himself. As a farmer, we perceive that he has derived a handsome livelihood from the cultivation of a few acres of land, and the employment of a small capital, in connexion therewith; whilst there are many proprietors of princely estates, who can scarcely contrive to banish want from their domains. We have pointed to the chief cause of such painful deficiencies; it remains for parents to diminish their number in future times, by taking present and suitable means to qualify their children to pursue their respective occupations with benefit to their families, and advantage to society. And whilst we are zealously laboring to amass property for our offspring, let us not be unmindful of their intellectual treasures, but remember always that the improvement of these can alone teach them how to enjoy and augment the wealth that we may give.]—*Ed. Am. Far.*

Brookline, Oct. 30th, 1821.

DEAR SIR,—I have, this evening, received your favor, dated 1st inst., inclosing some valuable seeds, and two numbers of your publication, for which I beg you to accept my acknowledgments. I should feel mortified that your interesting journal should have been published near three years, without my availing myself of its information. The fact is, I have been a subscriber through our mutual friends Messrs. Wells and Lilley, from the beginning.

I am happy to hear of the safe arrival of the pigs, and more gratified that you are pleased with them. It will give me great pleasure to send the boars you wish in the spring; and they shall, as you desire, be of different parentage from those you already have. I am fully satisfied, from repeated trials, that a fine race of animals cannot be kept up by breeding *in and in;* and I have both in my sheep and swine, two distinct families, which are crossed with each other. And except to supply the number of each kind I want to breed from, the individuals of the same family are never allowed to come together. By attention and strict adherence to this plan of crossing, where both kinds are good, I have a fine healthy stock. The animals are improved, both in size and symmetry, and their disposition to get very fat, at an early age, has been increased. At twelve months old, the pigs you saw in my various pens, averaged 280 lbs.; and many of them exceeded 300 lbs. each. This weight as they were fed almost entirely upon vegetables, was very satisfactory. A larger race has been often recommended to me by my neighbors. But a large race would not only require more food, but it must also be of much richer, and of more expensive quality. Boiled cabbages, turnips, and other vegetables, whose acreable produce is large, and which constitute the principal sustenance of my own breed, would make but poor returns when given to a larger framed animal. My establishment consists of twelve breeding sows and two boars, that are kept as long as they bring fine litters of pigs; failing in this, they are fatted, and their places supplied by others of one year old, before they are put to the male. The sows are put with the boars the 1st of April, and the 1st of October, and farrow twice a year. Their inside pens are eight feet by five, and their outside pens are three by four feet. About the time they are expected to bring forth, the styes are littered with straw cut into chaff, very fine, that the little pigs may be dry and warm, without being entangled with long straw, and thus destroyed. The litters are always regulated so as to leave not more than eight pigs to any one sow, either by changing their mothers, when necessary, soon after their birth, or by removing supernumeraries. I have always found a family of eight pigs at a month old, worth more than one of twelve; their growth being so much greater. From each outside pen the pigs have access through a small hole, to a common yard, which is always kept well littered; in which they play; and where dry corn is placed in shallow troughs to induce them to eat as early as possible. Each party knows their mother, and they find their respective pens without difficulty. These pigs are *always* weaned the 1st of October, at six or eight weeks old, that the sows may be again in the way of their duty, and my system progress. From these pigs I select seventy-two, and dispose of the rest. They are put into twelve pens, containing six each, and are fed with the best food my swill trough affords, six times per day, for the first month, and three times per day afterwards. The inside pens are six feet square, and the outside four feet by six, both planked, with a quick descent for the dirt, &c. to be carried off. Much, *indeed everything*, depends upon their sleeping dry and warm, and being well littered, and kept perfectly clean. In these pens they remain six months, or until October and April, when they are all transferred to the fatting pens, and their places supplied by the newly weaned pigs. The fatting pens are planked—there is a cellar under them, and each pig is allowed an area of about twelve square feet to live in; for these there are no outside pens. The fatting pens are cleaned out every morning, and fresh litter given. For three months the pigs in them are fed from the swill trough as store pigs; at the end of which time, say January and July,

their fatting commences, which consists in adding, for each of them three quarts of cracked corn to their daily allowance of vegetables, for three months, when they are killed as near the first of October and the first of April as may be. Thus you will observe the 1st of October and the 1st of April are busy days in my piggery, and the little pigs are then weaned, the sows again put to the boars, the fat hogs sold off, the store pigs removed to the fattening pens, and my system completed.

To feed this stock, consisting of
72 pigs from one to six months old, and
72 pigs from six to twelve months old, and
12 old sows, and
2 boars; in all

158 mouths—we boil a kettle of vegetables, containing six bushels, to which is added one bushel of cracked corn three times a day, and after putting this mass into the swill trough and mixing it intimately, we add as much water as will make 112 gallons, or for each bushel of vegetables and corn sixteen gallons. This swill is then distributed *sweet* and *warm* to the stock, morning, noon, and night, with great regularity, in the following proportions, viz:

In October, November and December—to each of 72 pigs, from one to three months old, one gallon; and to each of 72 pigs from six to nine months old, three gallons.

In July, February and March—to each of 72 pigs, from three to six months old, two gallons; and to each of 72 pigs from nine to twelve months old, 2 gallons, with 3 quarts of corn.

In April, May and June—to each of 72 pigs, from six to nine months old, 3 gallons; and to each of 72 pigs, from one to three months old, one gallon.

In July, August and September—to each of 72 pigs, from nine to twelve months old, 2 gallons; and to each of 72 pigs, from three to six months old, 3 gallons with 3 quarts of corn.

8 galls.	8 galls.

And these eight gallons, divided by their terms, or four, show that on an average, throughout the year, two gallons are required daily per head for the 144 pigs; or equal to 288 gallons; and to our twelve breeding sows, and two boars, we give per day, three gallons each, or equal to 42 gallons, making, altogether, an aggregate of 330 gallons; thus quite consuming our three messes of 112 gallons each. By the different ages of the pigs, as above combined, we have a constant and daily call for the same quantity of swill throughout the year, so that our business proceeds with perfect regularity.

Baltimore, Nov. 21st. 1825.

Dear Sir,—Your detailed account of the management of your piggery, has afforded me great pleasure and instruction. And your very obliging offer to send me a list of the vegetables raised for your monthly supply, tempts me, not only to ask for it, but for some other explanations which you likewise proffer. I am anxious to have a summary view of the total quantity of each and every kind of food used in your piggery per annum—the cost of raising or purchasing the food—the extent of and on which it is, or might be raised—the labor of feeding and attending at other times—the annual weight and value of the pork killed—the usual number and value of supernumerary pigs—the probable value of your farm, and the food consumed—and the quantity and quality of the manure saved or produced, as well as the cost of an equivalent in manure, if otherwise obtainable. I have, you see, some curiosity; but I persuade myself, that it cannot give one so systematic as yourself, any trouble to answer me on each of these points, and in a way to show me at a glance of the eye, that it is better for you to convert your vegetables and corn into pork and manure than sell vegetables; whilst I shall at the same time, be taught economy and method by your precept and example, which I will endeavor to observe, and imitate at my breeding establishment. I feel somewhat at a loss as to the manner of building my pens; and on the inclosed paper, you will see doubts exemplified in rough diagrams; your correction on these would particularly oblige me. It is my desire to build them in a long narrow shed, on one side of my barn yard; and to have at one end, cooking and vegetable apartments.

At your request, I am induced to ask whether it would not be better, that is to say, cheaper, to steam than to boil your vegetables? I have seen it stated in the explanations of Scotch implements, published by the Board of Agriculture, in the year 1814, that one person, by a simple apparatus, may steam in an hour, food enough, say of potatoes, to feed fifty horses a day, at 32 lbs. for each horse. And I had quite concluded to procure a boiler and steaming box from Scotland, on the strength of that statement.

I have been led to make some inquiries of you in this letter, from an attempt to push your proceedings to their results; as you will see by the enclosed estimates, which will best define the most of my inquiries.

Do you give the swill warm in summer as well as in winter? Do you spay your sow pigs, or put fattening sows to the boar, shortly previous to killing? Have you used the mangel wurtzel and observed its comparative value or relish? I think highly of it, and wish that it may be fairly tried by every farmer in this country. In our climate it is more certain and productive than any other root. On this head I beg leave, however, to refer you, for my opinions, to No. 5, vol. iii. of the American Farmer, in the notes on Mr. Cooper's account of his several crops. And I remain, truly, sir, your obliged and obedient servant,

JOHN SKINNER.

Nathaniel Ingersoll, Esq.

Estimate of Food, Fuel, Labor, &c. employed at Mr. Ingersoll's Piggery, per annum.

6 bushels of vegetables, roots, &c. three times per day=18 bushels per diem, for 365 days=to 6570 bushels per annum, which at 25 cts. per bush.=		$1,542 50
1 bushel of corn 3 times a day added to the above for 365 days, equals	1095 bu.	
13½ bushels or 3 quarts per day given to each of 144 fattening hogs, for three months or 90 days,	1215	
Corn per annum,	2310 bu.	
at 50 cents,		1155 00

Fuel 1½ cords per month, sawing, &c., 18 cords,		100 00
Labor one man and one boy, wages and board,		250 00
Yearly value bestowed on Piggery, Dr.		$3147 50
Cr. by Pork and Pigs sold.		
142 hogs at 280 lbs. 39, 760 lbs at 6 cts.	$2385 60	
24 pigs, one by each sow, at each farrow, over and above 9 suckled, $1,	24 00	
		2409 60
		$737 90

Showing a difference lost by using the food in the piggery, instead of marketing it, provided the corn and vegetables are valued at a price at which they could be marketed free of expense, and also return manure enough to keep up the fertility of the soil, which I presume might be done near this city, if not near Boston.

And if this is practicable near Boston would not the sale of vegetables and purchase of manure be attended with less care than the piggery, and be more certain? And at what price is the manure of stables to be had at Boston, say per load, of given cubic feet, when unrotted? And do your owners of market farms, who have been successful and long established, buy manure, and at what rate? An elucidation of my attempt to estimate your operations, will give me the marketable value of your vegetables at home and in Boston, as well as an idea of the expense of converting them into money by direct sale, all which will be very acceptable and useful to me personally, if you can find time conveniently to furnish it.

Estimate of Land and Labor required for the Piggery, &c. &c.

For 2,310 bushels corn for piggery, at 40 bushels per acre,	68 acres.
For 6,000 bushels vegetables, 500 bushels per acre,	14 acres.
Acres for piggery,	72
For the farm purpose to support 2 horses and 2 oxen, say grain and grass,	16 acres.
Pasturing, orchards, lots, &c.	12 acres.
Acres,	100

Labor required to cultivate 100 acres as above, say 2 hands, 12 months wages and board,	$300 00
For additional labor, spring, summer and fall, suppose to be equal to the expense of 6 hands for six months, or 3 for a year,	450 00
Annual labor, say	$750 00
A farm of 100 acres of first rate character might be worth $100 per acre,	$10,000 00

And the increase of value, attributable to augmenting population, would be more than equivalent to the wear and tear of utensils and stock employed.

The interest might therefore be considered as rent,	$600 00
Add for taxes,	25 00
And for labor as above,	750 00
	$1375 00
Then the farmer for his time may be considered as earning on a permanent scale, over and above interest, on his capital, by his piggery, for his own support, provided the manure keeps up the fertility of his soil, about	1034 60
	$2409 60

Brookline, Dec. 24th, 1835.

Dear Sir—I received your favor of the 21st ult., a long time after its date, and not until it was much worn and chafed with its travels ere it reached me. I will endeavor to answer your inquiries in detail. The following is a "summary view of the total quantity of each kind of food used in my piggery per anuum," and the months in which they are used; beginning with the1st of July, which is about the time I begin to depend upon summer vegetables, viz:

	bush.
July and August—Mangel wurtzel, roots, and tops being the thinnings from two squares each, containing 32 rods, -	800
Summer squashes - - - -	200
Early cabbages - - - -	100
September, October and November—	
Winter squashes or pumpkins - -	700
Large drum head cabbages - -	800
Trimmings of mangel wurtzel turnips, &c. &c. - - - - -	150
December, January, February, March, April—Mangel wurtzel,* (roots) -	200
Carrots - - - - - -	900
Ruta baga, - - - - -	200
Cabbages - - - - -	1500
May—Parsnips which are left in the ground during the winter, and allowed to grow in the spring, until their tops are from 4 to 6 inches high, when they are daily dug as wanted, and all boiled - -	500
June—Potatoes, - - - - -	250
Early lettuce, peas, chopped up vines and pods when the peas are full grown, though still green - - - -	250
Bushels,	6550

We always mix the vegetables by boiling some of either kind in each kettle.

My farming, or rather gardening, goes upon the principle of cultivating but little ground, and by great attention to get large crops, and in some instances two from the same land. The form of one piece constantly in cultivation is an oblong, thus divided with an alley or walk 4 feet wide in the centre.

No. 1. Of the upper side was sowed this year with mangel wurtzel, thinned out several times as described in a former letter, and finally cabbage plants set out two feet apart, (for winter crop,) taken from square No. 3, of the lower side.

No. 2. Has now a crop of parsnips left to grow the next spring, to furnish food for the month

* Cabbages and mangel wurtzel used first.

of May. The frost, however severe, does not injure them, and they are very much liked by the hogs. The advantage of preserving without trouble through the winter makes them valuable.

No. 3. Upper side, produced parsnips that were dug in the month of May, and 4th of June was sowed with carrots. Produce 237 bushels of the short kind.

No. 1. Of the lower side was cropped with carrots this year; of the long orange kind. Produce 248 bushels.

No. 2. Bore the crop of mangel wurtzel I described to you in a former letter.

No. 3. Cabbages.—The ground was laid out in 8 beds, 4 rods long, and 1 wide; the 12th June, it was sowed with Pomfret cabbage seed, in rows 2 feet asunder. They were thinned out, as plants were wanted to set other places, so as finally to stand 2 feet apart. Produce 500 bushels.

This piece of land is constantly cropped in such routine that the same vegetable occupies the same square once in three years. Each square is annually manured with *well-rotted* hog dung, and always at the rate of 4 cart loads for 40 cubic feet. The cabbage square has in addition 20 bushels of unslacked wood ashes.

The aggregate produce this year of the whole 6 squares, or 1½ acres was as follows, viz:

$8\frac{1}{2}$ rods wide

32 sq. rods No. 3 Carrots.	32 rods No. 2. Parsnips.	32 rods No. 1. Mang. Wurtz.	24 Rods Long.
No. 3 Cabbages.	No. 2 Mangel Wurtzel.	No. 1 Carrots.	

Upper Side.

No. 1. Mangel wurtzel tops and roots all boiled together	510 bush.	
Cabbages transplanted	500 do.	
		1010 bush.
No. 2 Now filled with parsnips—no doubt	500	do.
No. 3. Carrots	237	do.
Lower Side.		
No. 1. Carrots	248	do.
No. 2. Mangel wurtzel	523	do.
No. 3. Pomfret cabbages	500	do.
Bushels	3028	

Upon the borders of this garden ground, which is one rod wide, I have a row of fruit trees. Under them we have lettuce, early cabbages, ruta baga for transplanting, and such vegetables as our family require. But upon the plot above described nothing grows to shade the crops devoted to the piggery.

A second piece of ground, contains a square acre, and is divided into 4 equal parts and cropped in this manner, viz:

One-fourth acre, early potatoes and peas for family use. Of the peas, those not wanted, are chopped up, vines and all, and boiled in June. This land is cleared soon enough for a crop of transplanted Swedish turnips, or ruta baga.

One-fourth acre summer squash. Produce 200 bushels.

One-fourth acre, carrots. Produce 310 bushels.

One-fourth acre, cabbages. Produce 560 bushels.

These two pieces of land are my sheet anchor —they are highly cultivated and neatly dressed, without a weed allowed to seed upon them.

I annually cultivate, besides, 3 acres of field land, by breaking up 1½ acres, and laying down the same quantity. These 3 acres are cropped as follows, viz:

One acre potatoes,	250 to 300 bushels.	
One acre winter squash or pumpkins	700 to 900 bushels.	
One-half acre cabbages	1000 bushels.	
One-fourth acre mangel wurtzel	250	Roots, tops, &c. given to sheep and cows.
One-fourth acre carrots	250	
	2500 bushels.	

These crops are an average for the last 3 years. My whole farm, (if it deserves that name,) is only 21 acres, within a ring fence. Of which one acre or more is occupied by buildings, yards, and approaches to them.

To carry on all my operations I keep two hired men through the year, one of whom however, does the duty of house servant at the same time; and I hire besides day laborers and cattle to plough, to amount of 150 dollars more. It occupies about the whole time of one man, to take care of my stock, consisting of 160 hogs, 60 sheep, 1 chaise horse, 1 cart horse, and 1 cow; though they are both together, and when the animals are fed, are employed in the gardens in summer, and in winter getting out manure for the next season.

In answer to your question respecting the "probable marketable value of the vegetables on my farm," I would observe that the kinds and quantities of many which I raise, could not be sold at all; as for instance, the mangel wurtzel, ruta baga and all the tops and trimmings of others. Mr. Quincy tells me, he this year sells carrots in Boston, after carrying them 8 miles, at 9 dollars per ton, or 18 cents per bushel. Cabbages are sold by the load at 2 cents each, or about 8 or 10 cents per bushel. Parsnips and winter squashes must be retailed, and pumpkins in any quantities would not sell for any thing.

To answer your question about market gardeners, I have endeavored to recollect who among my neighbors have been successful and long established in that line, and I cannot select a single individual who has not driven his own cart to market, until he had sons old enough to take his

place, and thus, by attending to the minutiæ of the business, prevented that fraud and deception, that a gentleman farmer cannot easily avoid. When I first bought my estate, I set up a market cart, got a stout horse, and a man well recommended; but my daily receipts kept growing less and less; my man and horse were out late every evening, and after a vexatious and mortifying experiment; I was convinced, that I must either find a market for my vegetables upon the place, and under my own eyes, or give it up as a losing concern; for I could not bring my mind to the constant and daily competition, for trifling sums, which a man habituated to it from infancy, rather takes pleasure in.

Manure bought in Boston, costs them two dollars per buck load, of 62 or 63 cubic feet, trod hard and moderately heaped, in its unrotted state. The expense of carting, put at the lowest rate, cannot cost the farmer less than $1 50 per load, and when they bring it on hire, they charge $2 50. My whole stock annually furnishes three hundred such loads, which after using all I want, find a ready sale among the market gardeners in my neighborhood at 3 dollars per load, they taking it away with their own teams.

This manure is without any mixture of pond mud, sods, &c. which, had I access to such materials, might be very profitably increased.

As it respects steaming, instead of boiling vegetables, the only expense saved is fuel, for the same labor is necessary in filling and discharging them. Our laboring people require to have their work simplified as much as possible, and their judgment not often called into exercise. Were I to tell my man to steam 18 bushels of vegetables, and to give one-third of them 3 times a day to the stock, the consequence would be, that a much greater quantity would be given at one time than another, and though the whole would be consumed in the course of the day, still the inequality of feeding would be hurtful. Besides in winter, particularly the swill must be very warm, which could not be at night with vegetables steamed in the morning. Upon the whole therefore, I prefer to say to him, "fill the kettle with vegetables, and after they are boiled away sufficiently to make room, put in one bushel of cracked corn and oats, and give the whole for breakfast," thus making out the exact line of duty, and leaving nothing to his discretion.

I give the swill warm in summer, and almost hot in winter, and always sweet and fresh. In conversation with Dr. Derby, he argued upon the propriety of feeding with sour food, and that cold. I have formerly tried it and satisfied myself it was wrong. Pigs may be habituated to eat it; but place this cold stuff in a trough, and a good smoking hot breakfast of mine in another beside it, and I will venture to say, they will soon show a preference.

I never spay sows, because *we have no one who knows the mode*, which is to be regretted. They are sometimes admitted to the boar a few weeks before killing.

In yours received yesterday, through Wells and Lilly, you ask my opinion of the Byfield breed of hogs. As breeders they are the worst I know.

The sows have small litters and destroy them oftentimes by laying down without any care. They are long coarse haired animals and very apt to be mangy; nevertheless to mix with almost any other breed, a Byfield boar is valuable, being a quiet race, and disposed to get fat at an early age.

The Bedford is a hardier kind, and make good nurses. But for our uses have too much lean meat in proportion to their fat—their hams from that circumstance are excellent; a cross between a Byfield boar, and a Bedford sow furnishes a profitable and handsome stock.

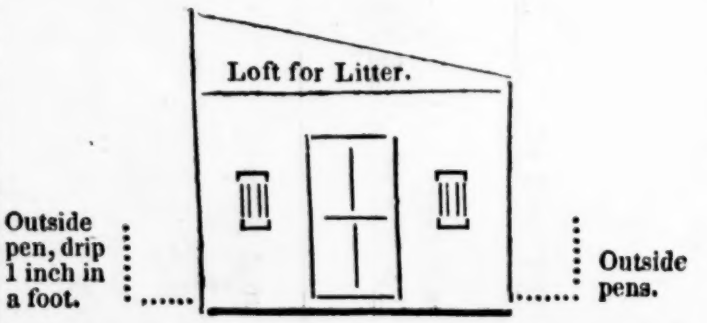
Inclosed is a sketch of my piggery. I thought it might assist you in determining the mode of building yours. I find mine convenient, and know not, that I could alter it advantageously.

I have thus, my dear sir, attempted to give a comprehensive answer to your interrogatories; if there is yet anything not perfectly clear to you I shall be happy to explain.

EXPLANATION [OF PLAN ON NEXT PAGE.]

1. Boilers.
2. Swill Trough.
3. Vegetable Bin.
4. Boiling House and Vegetable Bin.
5. Passage to feed.
6. Small pens for sows to pig in, in cold weather.
7. Passage to feed.
8. Grain Bin.
9. Outside pens for sows—4 feet by 7½.
10. Inside pens for sows—7½ feet long by 5 wide
11. Inside pens for store pigs—6 feet square.
12. Outside pens for store pigs—4 feet by 6.

a. Troughs.
b. Door.
c. Trough Door.



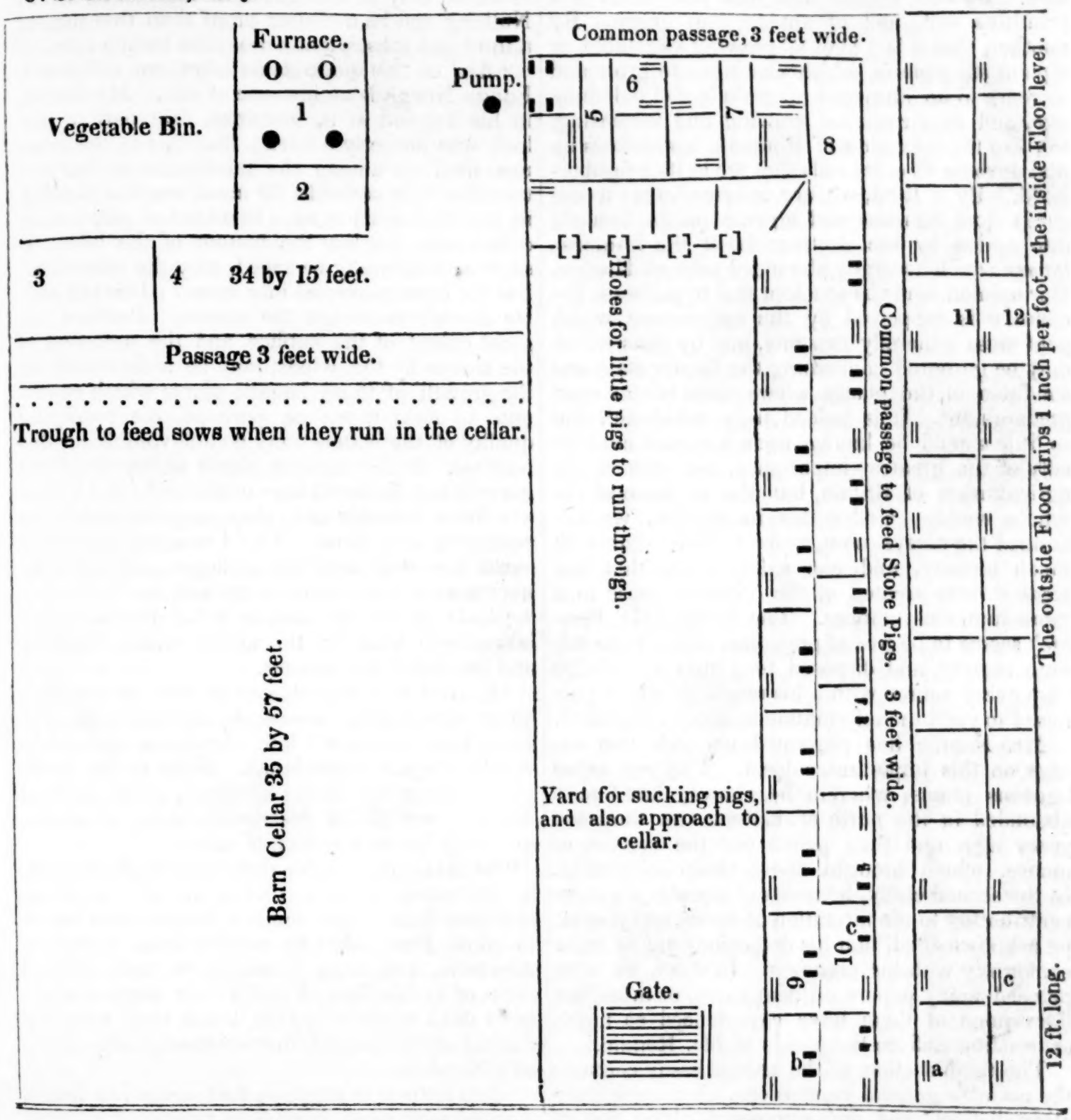
I have found it necessary to have communication with all the pens, from the principal *inside* passages for the facility of moving the sows and store pigs, because outside doors are apt to be frozen down in winter. The spaces at the ends of the troughs, are therefore sliding doors, as all others are. The four pens near the boiling house, are made tight with covers, for sows to farrow, in very severe weather. The hogs are all fed from the common passage, under cover. They eat more comfortable, and the troughs are never filled up with rain or snow. The outside pens of the sows, when they have pigs, are cleared into a cart, and the manure carted away, that the yard for sucking pigs may always be clean—and where they will soon learn to eat whole corn, if placed in shallow troughs. They have holes sufficiently large for them to run out of.

Since you were here, I have been obliged to new lay the floor of my piggery, and have now arranged the pens conformable to the above sketch. I have also dug a well in the boiling house, and have the nose of the pump placed high enough to carry water into the kettles. Should my spring fail, I shall by spouts, conduct the water that falls in rain upon the building, into the well. My fat-

ting hogs, you will recollect, are fed upon the barn floor, aud cleaned into the cellar, where the sows run before they pig.

NATHANIEL INGERSOLL.

J. S. SKINNER, Esq.



From the Farmers' Magazine.

REVIEW OF "ESSAYS ON THE NATURAL HISTORY AND ORIGIN OF PEAT MOSS"—*By the Reverend R. Rennie.*

Philosophers are not at one with regard to the nomenclature of soils. It is plain, however, so far as regards practical and useful purposes, that soils may be classed as clay, gravel, sand, and peat earth; and that to one or other of these soils, the numerous varieties to be found in the British isles are less or more allied, though the degree of affinity betwixt them is, in many cases, difficult to be ascertained. Loam has generally been treated of as an original soil, though we are disposed to view it as an artificial one, produced by the application of calcareous matter and animal and vegetable manures. Even peat earth may be converted into a soft black loam, and rendered fertile and productive by different processes; such as draining, liming, and mixing it with clay or any other soil, which has a stouter body, or contains a greater portion of vegetable substance. From these circumstances, a degree of confusion prevails respecting the nature and properties of several soils, which renders every description of them more abstruse than at first sight might be expected. Even the admixture of surface and substratum by deep ploughing, augments the confusion, and serves to produce a change in the original soil, of considerable magnitude.

It is only with one of the varieties of soil, however, which we at this time have any business, namely, peat earth, or moss; but when it is considered, that this variety forms the surface of at least one-sixth of Great Britain, the subject will appear of such importance as to call for the most minute and serious investigation. After all, we are not sure whether peat earth should be considered as a primary or original soil: we are rather disposed to view it as an artificial one, and produced by certain substances deposited on the surface of the earth. On these points philosophers are greatly at variance, entertaining such discor-

dant opinions, that we are much inclined to think, few of them understand the nature and properties of moss, or are acquainted with its origin and history. By one we are told, that peat earth is a primitive soil, and of antediluvian origin. By another, that it is a kind of growing vegetable, or a plant *sui generis*, which continues to grow and increase to an immense magnitude and indefinite age, and may continue growing and increasing, till, like the lean kine of Pharoah, it swallows up and devours all other soils that are in its neighborhood. By a third, we are informed, that it proceeds from ligneous and aquatic plants, brought into action by the destruction of the immense forests which anciently abounded over all Europe. Our opinion leads us to adopt this hypothesis, because it is supported by the appearance which peat moss generally presents, and by facts which may be gathered concerning the former state and condition of the places where moss is now most predominant. It is indeed truly wonderful, that so little should be known upon a subject confessedly of the greatest importance, not only to the agriculturists of Britain, but also to those of the whole world. Under this impression, we examined the essays now under consideration with much anxiety, and can safely state, that few writers have treated of the origin of moss in a more luminous manner. The author (Mr. Rennie) seems to be free of prejudice, attentive to minute inquiry, and disposed to gather knowledge from every source within his reach, or which promised to yield the information he was in search of.

Mr. Rennie has presented us with two essays on this important subject. The first is on ligneous plants, wherein he shows, that forests abounded in the north of Europe two thousand years ago; and then points out the causes, or means, which brought about their destruction. In the second essay, he treats of aquatic plants as contributing to the formation of moss; and it must be acknowledged, that his deductions are in strict conformity with his premises. In short, we have perused many papers on peat earth, or moss, but from none of them have experienced so much satisfaction as from the essays of Mr. Rennie.

The tenth section of the second essay contains the author's general conclusions, all of which are clear, distinct, and well expressed. The first of these conclusions is, that moss is of vegetable origin. The second, that all moss is either composed of ligneous or aquatic plants; and the third is so much to our mind, as to encourage us to lay it before our readers.

'*Thirdly*, From the above account we may conclude, that many regions now covered deep with moss, were at one period arable lands, at another forests, at a third lakes.

'We may still trace these changes, and mark their progress, in many mosses. For instance,

'1. Under some mosses the marks of the plough, and even ears of corn and other grain, with various utensils of husbandry, have been found.

'These are clear evidences that, at one period, the above surface was a ploughed field.

'2. In these ridges a vast variety of trees are found, some standing erect, others fallen prostrate, but all with their roots fixed in this subsoil of arable land. This is a proof that, at a second and subsequent period, the surface was covered with a forest.

'3. These trees are sometimes found immersed in moss of a semi-liquid state, to the depth of 10, 20, or 30 feet; and aquatic plants, such as flourish in water, may be still traced through all its depth. Nothing can be a clearer proof than that this, at a third and subsequent period, has been a lake.

'And in this stage some lakes are still found. Lough Neagh is an instance of this. Mr. Smith, in his account of it, mentions, that part of this loch was formerly a forest; that this is the common tradition among the inhabitants of that district; that it is probable, for much wood is found in it; that this wood is sunk in a kind of pulpy moss called mire, black at the bottom of the lake. If so, it will naturally be asked, why the whole loch has not been converted into moss? It is impossible for me to assign the reason. Perhaps the great extent of the surface, and the agitation of the waters by the winds, may be unfavorable for the growth of those aquatic plants which contripute to form moss; or, perhaps, the petrifying quality of the waters may be unfavorable for this purpose. If the aquatic plants above described grow in any sheltered bays of this loch, and if they are there accumulated, they may ultimately be converted into moss. This I mention, merely to excite the attention of the intelligent part of the inhabitants of that district to the subject.

'4. It is certain that, in other places, many lakes have been, by the above means, filled up and converted into mosses.

'5. And it is equally certain that, at a subsequent period, these mosses, by consolidation, may have been converted into meadows, and afterwards into rich arable lands. Most of the fertile plains along the banks of rivers, in the north of Europe, are of this description; they, of course, generally lye on a subsoil of moss.

'So that it is probable that many of these have, in the course of ages, undergone all the above changes; from arable lands to forests, from forests to lakes, from lakes to mosses, from mosses to meadows, and from meadows to their original state of arable land; I call it their original state, but I think it probable that, before they were first cleared and cultivated, they were originally covered with wood.

'It is natural to suppose, that many low levels, covered with wood, have been converted into morasses. The trees, by falling into decay, and stemming the course of rivers, may have occasioned such a stagnation of water as to cause this change. It is equally natural to suppose, that such low levels may have been converted into deep lakes. The mouths of rivers may have been so stemmed, by accidents such as I have decribed, p. 51 and 52 of my first essay, as to raise the waters in the valley to a level above all the plants and trees that originally sprung up and flourished in it. If this valley was of small extent, and the lake formed in it favorable for the growth of aquatic plants, the whole waters may have been first covered over with a matting of these. By consolidation, and the continual accession of vegetable matter, the whole lake may have thus been converted into a moss.

'All those mosses which are deep, and contain trees, some standing erect and others prostrate on the original subsoil, and especially those which contain a rushy, reedy peat above these trees, and a black compact moss above this, seem to me to

have undergone these changes; and the vast extent of mosses of this description over Europe, probably originated in this way. It were superfluous to enumerate instances of this. I shall only specify two; the first is Low Modena, which seems to have undergone all these changes; the second is the bog of Monela in Ireland, which seems to have been subjected to a similar succession. Ramazini describes the former; Carr, in his 'Stranger in Ireland,' delineates the latter.

'The stratification of the vicinity of Modena is somewhat singular. "The surface of the valley if now a rich arable field. At the depth of 14 feet below this, it is said that the rubbish and ruins of an ancient city were discovered. Paved streets, and pieces of mosaic work were found at this depth: below this the earth is solid, and seems not to have been moved: lower down is a loose, moist soil, mixed with vegetables; and, at the depth of 26 feet, entire trees, such as filberts, with nuts, and a great quantity of branches and leaves, have been dug up. At 28 feet deep, a stratum of soft chalk, mixed with shells, was discovered. This stratum is 11 feet thick. Below this, at the depth of 40 or 50 feet, there is to be found the soil of a low marshy country, full of sedge, reeds, shrubs, roots of trees, nuts, ears of corn, leaves of trees, branches, and boughs." He even describes the species of wood. He says, that oak, elm, walnut, ash, and willow may be distinguished. "Some of these trees are broken down, others stand still upright as they grew. Among these are found old Roman coins, marbles, stones squared and cut by the hands of men. Each tree is found on the soil most adapted to its production. The fir roots are fastened in the sand, the oak in the clay."

'The whole of this valley, he says, was a lake in the reign of Julius Cæsar. The surface is now drained and consolidated, and converted into arable land.

'It seems obvious to me, that this valley has undergone all the changes above described; at one period it has probably been arable land; hence the ears of corn, &c. which have been discovered: subsequent to this, it seems to have been overgrown with wood; hence, the trunks and roots of trees: this wood seems afterwards to have been converted into a morass; hence the sedges and reeds, &c. which are found: this morass seems to have been after this consolidated by alluvion; hence the stratum of soft chalk and shells.

'Above this, another generation of a forest seems to have sprung up; hence the other tier of branches and leaves of trees. This second generation seems to have undergone the same fate with the first; the moist soil mixed with vegetables above it, seems to be the remains of the marshy plants that must have sprung up after this forest was also converted into a morass.

'This morass seems again to have been consolidated, probably by alluvion; hence the stratum of solid earth: on this the city seems to have been built; hence the paved streets, &c.: the 14 feet above this seems to have been formed after the city was overwhelmed with some inundation.

'Whether the lake that existed on the spot at the age of Julius Cæsar was thus formed, it is impossible to decide. If so, however, the 14 feet of solid soil above this city, must have been formed since that period.

'That many low lying valleys in different parts of the world have undergone similar changes, is not only probable but certain. The mosses of Ireland exhibit similar proofs of this: in digging deep into these, recumbent forests upon forests are found, with a layer of earth between.

'This leads me to notice the other instance mentioned by Carr, in his 'Stranger in Ireland:' He says, "that the bog of Monela is not far from the bog of Allan: stumps of trees are still visible on the surface of the former; under these lies a stratum of turf 10 or 15 feet deep: under this, a tier of prostrate trees is discovered; beneath these another stratum of earth is found of considerable depth: and below this a great number of stumps of trees are found, standing erect as they grew. Thus, there is a succession of three distinct forests lying in ruins, one above the other."

'He says, "Some of these mosses have been perforated deeper than 50 feet: at the bottom of many of them, he observes, arable land has been discovered, bearing the marks of the plough, and formed into regular ridges."

'These fragments of the natural history of mosses, may furnish us with some faint ideas of their origin and formation. If we were to discover the hulk of a ship, or even a few beams, sunk in the ocean, we would be at no loss to say, that these were the remains of a wreck. The size of these beams might easily lead us to distinguish between the wreck of a frigate and a first-rate man of war. The state of preservation in which these are found, might give us some idea of the period at which the wreck happened.

'It is precisely so in examining the history and origin of peat mosses. The ruined forests found in these leave us no doubt that they have been partly formed of the wrecks of these. The size and species of trees lead us to conclude what must have been the age of the forest when it fell into ruins. The state of preservation of these trees, and the depth of soil formed above them, may give us some faint idea of the period at which they fell. The remains of aquatic plants, reeds, and rushes, &c. found above them, give us likewise an idea of the cause of their ruin; and the stratification of the soil exhibits a view of the changes it has undergone in the lapse of ages.'

In these essays, Mr. Rennie has only endeavored to ascertain the materials of which moss is composed, and to show how those materials have been accumulated together. But he promises, at an early period, to lay before the public a series of other essays, respecting the uses to which moss may be applied; a subject certainly deserving of the most sedulous investigation. If these future essays are written with the like spirit as animate those before us; if they are executed with similar judgment, and directed by practice, not by theoretical speculation, then we may expect to receive more satisfactory information about the nature and properties of moss, and the economical purposes to which it may be applied, than has hitherto been communicated by any other writer. N.

To the Editor of the Farmers' Register.

LEGISLATION FOR AGRICULTURE.

The whole attention of our legislative assemblies, both state and federal, is taken up to the entire exclusion of the agricultural interest of the

country, an interest, in which every individual is more or less, directly or indirectly, concerned; for, if the farmers fail to make good crops, and can spare little or nothing for market, after laying up a sufficiency for home consumption; what is to enable them to buy goods of the merchant, to pay the doctor's bill, the mechanic, &c.: and from whence will the merchant, the lawyer, the doctor, the artizan, manufacturer and mechanic, derive their supplies; how are they to get their bread-stuffs, beef, pork, bacon, and indeed almost every thing else upon which they subsist, if the farmers fail to make it for market? There is no class of people among us, that are not more or less affected by the prosperity or adversity of the agricultural community; and yet how little is thought of legislative aid, to foster and advance the interest of this important science and branch of industry. We are expending, and likely to expend, millions in internal improvements, and useless and angry debates, upon subjects of less importance, in my humble opinion, than agriculture, whilst that subject is lost sight of, as one of minor importance. I would not be understood as being opposed to internal improvements; but I would say, the greater the agricultural improvements and productions of the country are, the greater necessity will there be for internal improvements, and the better condition will the country be in, to pay for them. I do hope the legislature of our state, now in session, will look around and reflect upon the unprosperous and neglected agricultural condition of our country. If a proper regard and due consideration is given to the importance of the subject, that body cannot adjourn, I think, and the members go home, and say they have discharged their duty to themselves and their constituents, without doing something, at least, as an entering-wedge, to encourage and promote the science. Some of our sister states are aroused to the importance of their agricultural interest, and their legislatures turning their attention to its encouragement and promotion; nothing would be more gratifying to me, than to see our legislature doing its duty in looking to this subject. We have some few good scientific farmers among us, and although the number, comparatively speaking, is small, yet, if their services were brought fully to bear under proper legislative enactments, great good might, and no doubt would, result to the community at large. You have, upon many occasions, raised your patriotic voice in favor of legislative aid upon this subject, but it seems your good counsel has only been read and heard. The people must arouse from their lethargy, and speak out upon this subject, let their representatives know their wishes and what they expect at their hands; then, perhaps, they will pause and reflect, and begin to do something. I should like to see an agricultural school established, with able professors, to be located upon a pattern farm, purchased and kept up by state authority. I think incalculable benefit would accrue from such an institution. The Smithson bequest to the U. S. of £100,000, received some months past, is subject to be disposed of by the present congress. Can a better disposition of it be made, than to establish a national agricultural school, provided it can be applied in that way, consistently with the will of the liberal donor?

P. T. SPRATLEY.

Surry County, Jan'y 17th, 1839.

To the Editor of the Farmers' Register.

PROGRESS OF DR. PERRINE'S SCHEME OF INTRODUCING TROPICAL PLANTS. LETTER OF CHIEF JUSTICE MARSHALL.

Indian Key, Tropical Florida, Jan'y 1, 1839.

Dear Sir:—After the delays and disasters, incident to human enterprise, myself and family reached this port, in safety, on the 25th December last: a detention of two months in the city of New York, being one of the penalties of seeking a vessel, the brig Lucinda, bound direct to Indian Key. Notwithstanding the ravages of the September gale, when the spray of the sea swept over this islet of twelve acres, I found my tropical plants more vigorous and flourishing than could be expected, from the circumstances under which they exist. They were generally planted in small boxes, not averaging more than eighteen inches long, by ten wide, and eight deep; yet some of them now support shrubs, or young trees, from eight to twelve feet high, with trunks of six to ten inches in circumference, which sprang from seeds planted in August, 1837.

A most beautiful leguminous tree the *serbania grandiflora*, now covered with its enormously large white papilonaceous flowers, has a stem of ten inches circumference and ten feet in height. In another box are *two* plants of the ----------* of five and seven inches in circumference, and of seven and eight feet in height. The earth in which they are planted is solely carbonate of lime, colored by vegetable mould. By the by, you may be aware of the fact that we have no other element [of soil] than lime along the whole Florida reef, and on all the islands from the Tortugas to Cape Florida. It appears principally in the shape of coral rock and calcareous powder, so that what is termed *sand*, should in reality be called coral powder, shell powder, &c., not a particle of silex or siliceous sand being found south of Cape Florida.

Avoiding further digression, I proceed to state, that as the savages will not permit our proceeding to the main land, the trustees of the Tropical Plant Company have decided to locate the preparatory nursery on the adjacent island of Matacumba, (which is four or five miles long,) and the clearing has already commenced; and as fast as the worthless indigenous plants shall be removed, the valuable vegetables of the tropics shall take their place. I have brought with me all the *seeds* of useful and ornamental plants which I could collect during the past summer in the green-houses and drug stores of the north; but the great task of transplanting *living plants* cannot be successfully accomplished until vessels shall run *direct* from northern ports to Indian Key. We had great expectations of re-

* A botanical name, totally illegible. If some of our most intelligent correspondents could but see the manuscripts of others, (as no one can judge fairly of his own hand-writing,) they would commiserate the condition of those who have to decypher them, or to guess at the writers' meaning, and are held accountable for all errors. Instead of each one of these correspondents complaining of occasional mistakes of undecypherable words of his own letters, he would be surprised at the general accuracy of the interpretations of such hieroglyphics.—ED. FAR. REG.

ceiving very valuable plants from the collections in Charleston, S. C. by the monthly mail-schooner from that port to this; but, at this very period when it was most essential to our success, the mail has been suddenly and entirely discontinued. It is, however, stated, that this post-office will hereafter be supplied with letters twice a month by the semi-monthly packet which sails from New York, via Key West to Saint Marks; yet, unless it be arranged that the same vessel shall also touch at Indian Key, we shall be entirely dependent on casual opportunities of intercourse direct. Under the hope, however, that the post-master-general will direct the semi-monthly packet to proceed *via Indian Key* and Key West to Saint Marks, we shall have ground enough prepared to *transplant* all the valuable vegetables from the green-houses of the northern states and of Europe which may thus be obtained through and from the commercial emporium during the ensuing months, and prior to the summer rains of tropical Florida. During this interval, I again respectfully solicit all easy aid to the tropical nursery which can be rendered through the facilities afforded for the transmission of seeds by the commissioner of the patent office. The trustees are able and willing to return ample equivalents for every seed, cutting, bulb, &c. of useful plants, which may be transmitted to them through the patent office before the first of June next. It is ardently to be desired that the bill to establish an agricultural department in the patent office will be speedily passed into a law; and that it will multiply a hundred fold the facilities for collecting and diffusing valuable plants throughout every district of our valuable country. If a thousandth part of the weight of the political newspapers carried by the mail to the most distant sections of the United States were substituted by an equal weight and bulk of useful seeds and plants, for distribution, it would be a million-fold more beneficial to all ranks and parties of our common country.

I am pleased to see the stand you have taken in opposition to the epidemic humbug of speculative sales of the silk mulberry tree. The greatest natural importance of the propagation of the mulberry trees consists in the fact that they are naturally adapted to propagate themselves in the poorest soil; and hence their value is infinitely diminished by the artificial process of forcing their multiplication for trading speculation. On this barren coral rock, Charles Howe, Esq. has thousands of the morus multiculis of the hardiest habits, yet he has refused to answer a letter of the speculator of the north from whom he bought his original cuttings, and who now wishes to speculate on their progeny. Very respectfully, your ob'dt serv't

HENRY PERRINE.

P. S. In looking over my papers I found the letters of Col. White and of Chief Justice Marshall, of which copies are appended for publication in the Register, if you think proper.

Washington, May 29th, 1832.

Dear Sir,—It may be gratifying to you to have a copy of a letter I have just received from Chief Justice Marshall, on the subject of your project. It must be highly flattering to the ambition of any man to have the commendation of such a distinguished and illustrious man.

I am, sincerely yours, JOS. S. M. WHITE.

Dr. H. Perrine.

Richmond, May 24, 1831.

Dear Sir,—The report of the committee of agriculture on the memorial of Dr. Perrine, to which I am indebted to your politeness, was received on my return from the court at Raleigh. I have read it with deep interest. If the growth of the tropics can be transplanted advantageously to Florida, the culture must be extremely profitable to that part of the union, and consequently desirable to the whole United States. The sisal hemp in particular, appears to be among the most valuable productions of nature. The description of its qualities may be exaggerated, still the experiment ought to be made. I trust the application of Dr. Perrine may be successful. I thank you for this mark of your recollection, and am, with great respect and esteem,

Your ob'dt,

J. MARSHALL.

We should be gratified to receive from Dr. Perrine a full and particular description of this little speck of our territory, of which the existence, as an inhabited place, is known to so few, and its character, in soil, climate, &c. is so very different from all the main land. Much of our own studies and investigations have been devoted to the characteristics of soils, caused either by the deficiency or abundance, or by the various proportions, of calcareous ingredients. But though some of the prairie soils in Alabama, of which we have heretofore reported the constituent parts, are *principally* composed of carbonate of lime, we have never yet known a soil so exclusively formed of that earth as it would seem is the case with the soil of this islet, judging from its original construction, (by the labors of coral insects,) as well as from Dr. Perrine's statement. It is desirable to know, from actual analysis, how small is the amount of all other ingredients of the soil; and what are the peculiar, or most favored products, of soil so exclusively calcareous. We should fear for the safety of Dr. Perrine's exotics in so peculiarly constituted a soil. The growth of mulberry trees on such a soil, though nothing is said as to the degree of their luxuriance, is alone enough to confirm the opinion which we had before entertained, and expressed, that this tree requires a highly calcareous soil; and though it will grow tolerably well on soils very deficient in this character, yet that its greatest vigor and growth can only be seen where lime has been abundantly furnished to the soil, by nature or by art.—ED. FAR. REG.

RANDOLPH'S TREATISE ON GARDENING.

[The following little work deserves the place which will here be given to it, not only for the value of its instructions—which, to their extent, are even now the best known for the region for which it was designed—but also as a literary curiosity, it being the oldest Virginian work on cultivation, of

any kind. The author was John Randolph, of Williamsburg, attorney general under the colonial government. The date of the work is not shown by any thing in the oldest edition which we have seen, which is as late as 1794.

The value of this unpretending little treatise has been so generally acknowledged, that it has passed through several editions. Still it is a scarce work, as must be soon the case with any which is of such small bulk, and published alone. The latest edition has many modern additions; but, besides other reasons for omitting these, we prefer to give the work to the public in its original form; which was without the name of the author, or without any introduction whatever to the notice, or recommendation to the favor of the public. It will be published altogether in this, the January number of the Farmers' Register, for more convenient reference and use.—ED. FAR. REG.]

A TREATISE ON GARDENING.

ARTICHOKES, known to the botanical writers by the name of *cinara*, are to be propagated either from the seed, which are to be gathered from the choke or flower at the head of the artichoke, or from slips, which are to be separated from the main stalk by the edge of the hand, and transplanted. If these offsets are good, they will be of a whitish color about the heel, and will have some little root to them. If you have plenty of ground, put three slips in a hill, and let the hills be four feet asunder, and the rows the same; but if you are scanty with regard to your land, you must cut your coat according to your cloth. About March, or the beginning of April, you are annually to slip off all the lateral branches with your hand, and leave only the three principal stalks in your hill. Every spring they ought to be dunged; sheep's dung and ashes are not only the best for that purpose, but also for preparing your ground for them. If you have depth of mould enough, i. e. two feet, and you don't crop your ground with any thing else, your artichokes will remain good a number of years; but if they are any ways neglected, or the ground is tended, they will not only be injured in their growth, but will very much degenerate in five years. When planted out, they should be well watered if not in a wet season, and kept clean from weeds. There are various methods of preserving them from the severity of winter. Some cut them down within a *foot* and cover them with a hill or ridge, leaving a small hole at the top which is covered with dung, others cover them entirely with dung. I have found from many years experience that long dung is an enemy to them, and that the best way to preserve them is by laying straw on the surface of the ground over their roots. This preserves the leaves from rotting, which fall down from the frost, and united, afford such a protection to the plants, that not one in fifty will perish. They never flourish in a dripping situation, but like a low place not too wet, but very rich. When you cut them, cut the stalk quite down to the ground, which strengthens the plants and makes them forwarder in the spring. There will be many on a stalk, but all must be pulled off except that which is on the centre of the main stalk, if you propose having them fine. If you prick out the slips in the spring, you may have a succession till the fall. The leaves of artichokes, I have been informed, clean pewter the best of any thing. There are different sorts, but two only that are much propagated. 1st., *folus aculeatis*, i. e. prickly leaves; 2d., *Folus non aculeatis capite subrubente*, i. e. without prickly leaves, smooth and reddish heads. The latter is most preferred. There is the *Cinara spinosa*, which is to be cultivated and eat like celery, which produces a head with the seed not unlike the artichoke, from whence it took its name. The common name is chardoon or cardoon. The Jerusalem artichoke, *helianthus*, is only a species of the sun flower with a tuberous root, not unlike a potato. Some admire them, but they are of a flatulent nature and are apt to cause commotions in the belly.

ASPARAGUS, *(growth a young shoot,)* are to be propagated either from the seed or roots. The seed are contained in those things which look like red berries. These are to be gathered from the most flourishing stalks, and laid in a tub for about three weeks to ferment. This will rot the husks, which will swim upon being rubbed between the hands and having water poured upon them, but the seed will go to the bottom. Pour the water off gently, and the husks will be carried along with it. This being done two or three times, the seed will become perfectly clean. They are then to be laid on a mat or dish, and exposed to the sun to dry. When that is done, they may be put into a bag, and pricked out in February or March, in beds about a foot asunder every way, and never to be transplanted. But if they are to be transplanted, they may be sown as thick as you do cabbage. If you propagate from the roots, those of a year old are most eligible, though if two, they will succeed very well. In planting them out, they should be placed about four inches under the surface of the ground, with the bud erect against the side of the earth perpendicularly cut, so that the extremities of each root may touch one another. This will put them about a foot asunder. The best time for transplanting them is when they begin to shoot, but before they appear above ground. The principal thing to be regarded with these plants, is the bed in which they are to be placed. A great apparatus was formerly made use of, but now seems on all hands to be disregarded. Nothing more is necessary than to make your beds perfectly rich, and light, that the head may not be obstructed in its growth upwards. Two feet of mould and dung is depth sufficient for any plant. They are to be kept clean from weeds, and nothing sown upon the beds. The fourth year from the seed they may be cut moderately, but it is better to wait till the fifth. About October, the haulm should be cut down and the beds covered with rotten dung about six inches, part of which may be taken off in February or March, and the remainder forked up in the beds, which will not only assist the roots but raise the beds in some small degree yearly, which is an advantage. A spade is a very prejudicial instrument to them. Cut with a blunt pointed knife (some use a *saw*) and separate the earth from the plant and cut it so as not to endanger the head of another that may be

shooting up. There are joints in the roots of the *sparrow* grass like the wire grass, from every one of which a head is produced. Butchers' dung is what it delights in. I would recommend your beds to be about four feet wide, that the grass may be cut without treading on the beds, which often hardens the earth so much that the grass can't come up, and must of course perish. In these beds I would have three rows, for the roots ought to have a sufficient quantity of earth on all sides. Beds thus managed, Miller says, will last ten or twelve years, Bradley 20, and I am inclined to join with the latter.

BEANS, *(faba fagein, gr. to eat,)* delights in a fine rich stiff soil, without dung, though that must be supplied where the lands are poor. To have fine beans, especially the Windsor sort, which is much the best, they ought to be planted six inches asunder, in rows three feet distant from one another, in the wane of the moon (as it is vulgarly said) and under a hedge which serves for a shelter. When the flowers begin to open towards the bottom of the stalk, the tops should be pinched off; though it is as good a season as any to do it in, when the blossoms are well blown and set. If you want an early crop, plant in October and hill them up as they grow, and shelter them; if a second crop, cut them down within 2 or 3 inches of the ground before they bear fruit. Dont pull the bean, cut it with a knife. The first production is the properest of all seeds for sowing. When the seed is ripe, you must pull up the stalks and sun them, observing to turn them every day or two. Beans, like all other seed, degenerate in the same ground, wherefore, 'tis advisable to change your seed, and the beds they grow in.

KIDNEY BEAN, *Phaseolus, Phaselos, (great or long swift ship,* which the husk resembles,) may be planted in March; if sooner, they must be well sheltered, (for they are easily killed,) in a light fertile soil, in trenches about two feet and a half asunder, each grain two inches distant from one another, and one inch deep. They will not bear transplanting. They should be planted in a dry season. The Dutch sort, which is the common kind, should be stuck, otherwise they lie on the ground and rot. This sort, if stuck, grow to a great height and afford a constant succession. A second sowing will supply you sufficiently the season. If, when you plant, it should be a dry season, water the furrows or trenches before you drop the seed in. French beans and snaps are the same. The Dutch sort are not so apt to be stringy, which the dwarf sort are.

BUSHEL or SUGAR BEANS, being of a tender nature, should not be planted till April, which is the best season, in hills made light and rich, about three to the hill, so as to admit a stake in the middle of them. They will grow round the stake to a great height, will bear very profusely, and continue till destroyed by frost. They are esteemed very delicate, and are of various colors, as white, marbled and green, &c.

CABBAGE, &c.—Under *brassica* is included all the several species of the cabbage, among which cauliflowers and brocoli are classed. The proper time for sowing the seed of brocoli is in the latter end of May, and transplant them into beds when they have eight leaves, and plant them out about the latter end of July, in a place well sheltered, not under the drip of trees, in a soil rather light than otherwise. About December, it is said, they will have purple heads, which are eaten, though I myself could never make them head before March. The distance these require is about two feet every way, though more would do better, if there is plenty of ground. The Roman brocoli is the proper sort to cultivate, otherwise called the Italian brocoli. When you cut the flowers or heads, cut to about five or six inches of the stem, and before they are boiled, strip off the skin, and after having washed them, boil them in a clean cloth and serve them up with butter, as cauliflowers are. The stems will eat like asparagus and the heads like cauliflowers.

The common WHITE CABBAGE, *capitata alba,* is the proper sort for winter. It is long sided and flat. The seeds should be sown in April or March, and if they should grow long shanked, they should be pricked out until the middle of May, when they are to be transplanted to stand at about two feet and a half distant from one another, and three and a half row from row. Three things are necessary to cabbages as well as other vegetables; to be watered in a dry season, hilled up if they grow long shanked, and kept clear of weeds, which draw the nourishment from the plants and make them spindle. In November, take up your cabbages by the roots, and plant them under a ridge of earth with the tops of their heads to the south, covering the stem entirely, and this will protect them the whole winter. If they are hard and compact when thus placed out, they will be sufficiently protected; and though the outside leaves may be affected by the frost, yet the hearts will remain entire.

The SAVOY CABBAGES, which are esteemed best when pinched by the frost, are to be treated in the same manner as the white, only they may be planted nearer one another, not being a long sort.

The BATTERSEA CABBAGE is the earliest of all, and head in a short time, and burst if not cut soon.

But the SUGAR LOAF, which is the finest, will remain a considerable time. These should be sown every month, and transplanted every season.

The BORECOLE, is treated like the white cabbage and need not be above a foot asunder. These are tough till the frost has made them tender.

There is a cabbage which is called the RUSSIA kind. They are very small, and soon degenerate, if the seed is not changed.

There's a TURNIP CABBAGE, which being very strong is fit only for soup.

The seed of the CURLED COLEWORT are to be sown in July, about twelve inches asunder.

There is a MUSK CABBAGE, *moschumoleus,* remarkable for its tasting like musk, and is to be treated in the common manner. I have met with these in Virginia; but Miller says they are not propagated much in England, though the most delicious.

The common COLEWORTS, should be sown the beginning of July and transplanted. There is a perennial colewort, which will in poor land remain four years, but in rich not above two, before they go to seed. In order to save the seed of cabbage,

they should be taken out of the ground in November, and put under a hedge or other sheltered place, buried up to the middle of the cabbage, and in the spring they will begin to sprout and produce their seed. If the season should be dry, they should be assisted with moisture, and the stems should be supported. When the pods begin to be brown, cut off the extreme part of every branch or shoot. When your seeds are ripe they should be cut off and thrashed out, when dry, and put into bags. By planting the several sorts of cabbages together, as white and red, &c. there is a commixture of the effluvia of each, and each are vitiated, which is the reason, Miller imagines, why seed so soon degenerates in gardens, as gardeners are either negligent or unskilful in this particular, too generally.

CAULIFLOWERS must be sown critically to a day, or else there is no dependence on the success of them. I cannot, nor do I find any one else capable of assigning a good reason for this, but the experience of this country, as well as England, verifies the proposition. We must therefore receive this fact as we do many others, rest ourselves satisfied that the thing certainly exists, though the mode of existence is an impenetrable secret to us. Miller says, that for spring cauliflowers the seed should be sown on the tenth or twelfth of August; but in Virginia the twelfth day of September is the proper time, which is much the same as in England, allowing for the difference of climate, the ratio of which ought to be a month sooner in the spring, and the same later in the fall; our summer months being so intensely hot in this place, they should continue until the 20th of October, where they are to remain all the winter protected from the inclemency of the weather; and towards the latter end of February, the plants shouldbe drawn, and planted in a good spot of ground for a crop, about three feet and a half asunder, Miller says; but I think six much better, on account of the earth it takes to hill them up when rampant. Gardeners are divided with regard to the manner of preserving them in winter and after they are planted out in February. Glasses are generally mentioned in the books of gardening, as most proper; but latter experience seems to contradict this position, because they make the plant spindle, which is to be feared and guarded against in cauliflowers, as they have a natural tendency towards luxuriancy; and therefore it is said that boxes, pyramidically formed, answer the purpose much better, for they equally protect the plants from frost, afford them full room to germinate, and at the same time do not draw them to such an inordinate length as glasses are apt to do, even with the best management. In order to have cauliflowers in the fall, you should sow your seed on the twelfth day of April, and transplant them into beds to restrain their growth, and in July fix them out to stand. As they grow they should be hilled up, otherwise, when they head, the winds will be apt to injure them. A rich light soil is what they delight in most. Col. Turner, of King George, who was eminent for cauliflowers, had a method peculiar to himself, for some years, of managing them, which succeeded beyond any other. He dug trenches about a foot and a half wide, quite down to the clay. With this, he mixed with a spade some long dung, into which he put his plants about five feet asunder, when they were fit to be transplanted; and as they grew, hilled them up with the best mould. This method answered the purpose of transplantation, for the clay repressed the growth of the plant, and the warmth of the dung afforded them just heat enough to live by, as they might without it perish for want of nourishment. I have found myself this method succeed the best. Virgin mould is preferable to every other sort. The gardeners near London have wholly abandoned the practice of watering their cauliflower plants in the summer, as a thing very injurious to them; and Mr. Miller coincides in opinion with them. Radishes or spinach sown among the cauliflowers, so as not to interfere with them, will preserve them from the fly, being a more agreeable food to that destructive animal. When your cauliflowers begin to flower, the inner leaves should be broke over them, otherwise the sun will soil their snowy color; and as they spread, the larger leaves should be served in the same manner. Some pin the outer leaves with a stick; but this is a malpractice, because it often binds the flower, so that it cannot grow to that size it otherwise might do. In November, when you have apprehensions as to the approach of intense frosts, take your cauliflowers up by the roots, in a morning, with as much mould as you can, and put them in the ground, in a hole dug about two feet below the surface, well sheltered by straw or thatching, as near one another as you please, and cut them as you have occasion. They may be preserved in this manner the greatest part of the winter, though they acquire an earthy taste from their confined situation. They are not so delicate in the winter, or fall, as they are in May; notwithstanding in May they are in the midst of other elegancies, and stand without any rival in the fall. That face must be fair indeed that shines amongst a multitude of beauties, which too often eclipse one another. When you meet with a cauliflower whose curd is hard and white, and free from frothiness about the edges, let it stand for seed; and as the flower branches, remove the leaves from off it, and fix three pretty strong stalks at equal angles about it, surrounded with pack-thread in order to support the branches, which might be otherwise broke by the wind. When the seed are ripe cut the pods off and dry them, and rub them out as you do cabbage seed. I have been told that seeds cannot be raised in this country, but I believe the contrary may be proved by a proper culture.

CARROTS, *Daucus*, (from *daio, gr.* to burn, from the hot taste,) are of two sorts, the orange and white, the former being generally used, though the latter is much the sweetest kind. To have them fine in the spring, sow them in drills about two feet distance, for the convenience of weeding them, about the latter end of August; and when they appear, draw them, so as to keep them about four inches asunder, and in February sow again for the summer, and in April for the fall. They choose a light warm soil, and should never be dunged with long dung, nay it is thought best to dung the ground the year before; for when they touch dung or meet with obstruction, they fork immediately. The seed should be rubbed before sown, to get rid of the husk to which they adhere. It should be sown in a calm day, as the seeds are very light and easily blown away. They should be trod down when sown, and raked smoothly over. When your carrots appear heady above ground, they should

be trod, that they may grow more below than above. In November take up your roots and put them in dry sand, and you may use them as occasion requires. About the middle of February plant out one of the most flourishing for seed, which when ripe, dry in the sun and rub out.

CELERY, *Apium*, (*quod apes eo gaudeant*, or from *Apex*, because the ancients made crowns of it,) is one of the species of parsley. At first I was surprised to find this, but upon examining the two plants there is in many particulars a characteristical likeness. Celery is the *Apium dulce*, *Celeri Italorum*, the seed of which should be sown in a successive manner to have it fine for any time, for after it is blanched it will not remain good longer than three weeks, or a month, but will rot or grow pipy. Let the first sowing then be in March, the second about a fortnight after, i. e. the last of March, the third in the beginning of April, and the fourth about the beginning of May. In about three weeks or a month, the seed will come up, and if your plants grow stout, as probably they will in good land, you must transplant them into beds, and in June those of the first sowing will be fit to put out for blanching, and the rest should be also put out as they appear strong enough to sustain a removal. When they are transplanted for fruit, dig a trench by a line about ten inches wide and eight or nine deep, loosening the earth at the bottom and levelling it; and the earth taken out of the trenches should be laid on the sides for the convenience of earthing. These trenches should be about three feet asunder, and the plants should stand six inches distant from one another, in a straight row, cutting off the tops of the plants, when planted out. As the plants grow up, they should be carefully earthed up in a dry season, else they will rot, not above the crown or heart of the plant, and in a light rich soil, they will grow to twenty inches in height, but in poor land will not exceed ten. Your first plantation should be in a moist soil, but not the latter, because the additional wet of the winter will rot your plants. The sun is a great enemy to celery, when it is very hot, wherefore I would recommend the covering of your plants with brush at all seasons of their growth whilst the weather is hot, from nine in the morning till six o'clock in the evening. When you desire to raise seed, draw one or more of your flourishing plants, and plant it out in the spring, let it be supported against the winds, and in August the seed will be ripe, which should be then cut up, dried, beat out and preserved in bags.

CELERIAC, *Apium dulce degener, radice rapacea*, (*Turnip-rooted*,) is to be treated much in the same manner as celery, except that the drills of these should be shallower, as this plant does not exceed ten inches in height, and requires but one earthing. The excellence of this consists in the size of its root, which is often as large as turnips. In summer, water your plants, if the season is dry; and in winter cover them with haulm, or any open covering, to protect them from frosts.

PARSLEY, *Apium hortense, seu petroselinum, vulgo*, if intended for the table, should be sown in drills pretty thick, in light rich land, but if for medicinal use, (the roots being prescribed on many occasions,) the seed should be sown thin, and the plants drawn and treated as is directed in the culture of carrots. Where you breed rabbits, it may be sown in the fields; hares and rabbits being remarkably fond of it, will resort to it from great distances. It is a sovereign remedy to preserve sheep from the rot by feeding twice a week on this herb, about two hours each time. If intended for the table, the seed should be sown early in the spring; if for medicinal purpose and rabbits, about the latter end of February in England, but about the middle of March in Virginia. The gardeners have an adage as to this plant, that the "seed goes nine times to the devil before it comes up," alluding to the length of time it lies in the ground before it germinates, which is generally six weeks. In this it resembles celery, as also in its foliage, and the head where the seed is produced. There are several kinds of parsley, but these I have mentioned seem the most useful and particular.

CUCUMBER, *Cucumis*, from *Curvatura*, abounding, because this plant is very pliable and crooked, is esteemed in its season the most refreshing and delicate of all vegetables, there are three sorts; 1st. *Cucumis sativus vulgaris, malmo fructu subleteo.* 2d. *Cucumis fructu albo*, the white cucumber. 3d. *Cucumis oblongus.* The first is the common sort most in use, amongst which there are differences in the size, length, &c. The second is cultivated in Holland chiefly, and the last sort is cultivated only in curious gardens, and are remarkable for their length and fewness of seed. As there are three sorts, so there are three seasons for cucumbers; the first is early, in hot-beds, the second is the middle crop, under glasses, and the third is for pickling. Although many are ambitious of having early fruit, yet it is certain that cucumbers are not wholesome till the hot weather comes on, for being pent up in hot beds, they inspire a confined watery air, which must necessarily make the plant crude and unhealthful. Towards the latter end of January, if you require cucumbers in April, you are to get about two loads of long dung, which will be sufficient for a moderate family, and mixing it with some sea-coal ashes, you are to lay it in a heap about three feet thick. In about four or five days the dung will begin to heat, and then you must take off part of the top, laying it flat on the sides of your heap, and put on about two inches of good earth, which must be covered with your glasses. In a day or two after when you find the earth pretty warm, put your seeds in the earth about a quarter of an inch deep, and keep it close covered with the glass all night and in bad weather, and the glass should be also covered with mat. In three or four days, the plants will appear, upon which you are to make a bed for a single light on the adjoining heap of dung, covering the top about three inches thick with mould, into which you are to put your plants, at about two inches distance each way, observing to put them into the earth almost up to their seed leaves. In 24 hours your plant will take root, and you are to give it what air you can without injury, turning the glass upside down in the heat of the day, or wiping off the water that it condensed in the upper part, and is very pernicious when it drops on your plants. You are to water your plants, though moderately, and your water should be as near the temperature of the air in which plant exists, as possible and as the plants advance, support their

shanks with a little dry sifted earth, which will much assist them. If your heat is too intense run a stick into the middle of the dung, through the sides of the heap in two or three places, which will give vent to the steam. If it be too slack, cover the sides of your heap with more litter. When the 3d or rough leaf appears, you are to prepare another heap, in which you are to make holes about a foot deep and eight or nine inches over, which are to be filled with light fresh earth, and in these, in four or five days, you transplant your plants, observing to water them as before, and to put four plants into each, with their roots sloping toward the centre, lest they should get to the dung and be injured by it. You should avoid keeping your glasses too close, for the steam may cause such a damp as will very much injure the plants. Your plants tending upwards when they are four or five inches high, should be forked down, and when you weed them, hold the leaves very gently with one hand and weed them with the other. Pulling off the male blossom is not recommended, neither is pruning the vines; but if your glasses are filled with too much vine, you ought to draw out one of the plants, provided it is not matted with those you intend to stand. Whenever your bed loses its heat in any degree, it ought to be repaired; and though the plant delights in heat, yet you must cover your glasses when the sun is in the meridian, and hot. In watering these beds, you must throw the water all over the vines, but not in the heat of the day, for the drops will collect the rays of the sun to a focus, blister and ruin the plants. And as at this season you have often cold nights, you should preserve the heat of the beds; and from this management your cucumbers will last till the beginning of July, when your second crop will come to bear. The management of the second crop is pretty much the same with the former, only you must raise your glasses oftener as the weather will be warmer, and your seeds are to be put into the ground in March or April. Miller directs that beds of dung should be made for the second crop as well as the first, and the same culture observed, but I believe if your seeds are sown in April in rich light hills and sheltered from the cold with glasses, it will answer just as well, provided you keep them free from weeds, and watered with temperate water. Most people are fond of gathering their seed from the first early fruit, leaving one cucumber only on a vine, nearest the heart of the plant, and this is a good way. In August your seeds will be ripe enough, and then cut open the cucumber and put pulp and seed into a tub there to remain 8 or 10 days, stirring them every day to the bottom with a stick; at the expiration of that time, pour water into the tub, and by stirring it often, and repeating it, the scum will rise to the top and your seed subside, which are to be dried and put into a bag, and are best when three or four years old. Your seed that are intended for pickles, should be sown in May, about nine in a hill, and in five or six days they will appear above ground; and for about a week after, till the plant has made some progress, are very liable to be destroyed by sparrows, they being very fond of them. Leave only four or five of the most vigorous plants in a hill, and observe to water in a dry season, and keep the ground about them loose and free from weeds. The earth should be laid round your plants in the form of a basin, to hold the water that is given them, and take care that your plants don't interweave with one another, and if any plants appear fading, or declining, pull them up. Fifty holes is the number advised, from whence you may expect to gather about two thousand in the season. Miller mentions the putting your plants into baskets, when they are fit to transplant, filled with earth, which may be removed with the plants in them, into other hot beds with great security, by which means you have a crop much earlier than in the method before mentioned. If cucumbers are stuck as you do peas, they will run to a great height, and will bear till the frosts destroy them.

CURRANTS, or CORINTHS, so called from a near resemblance to a Corinthian grape, *(ribes by the botanists)* have many species, but the two principal are the red, and white of which the Dutch sorts are chiefly propagated in England. They are to be propagated from cuttings, planted in the fall, (September) and are directed to remain two years, when they are to be removed into beds, and planted in rows ten feet asunder, and four feet from each other. But the cuttings will succeed as well if planted in a rich light bed to stand without any removal at all. They will grow either against walls, pales, or espallers. If some are planted against a south wall or in a warm place, and others in a colder situation under a north wall, the fruit will last a long time, as there will be a succession. The fruit grows on the former year's wood, on small snags, which come out of the old wood; wherefore, in pruning, these snags ought to be preserved, and the young shoots shortened in proportion to their strength. In pruning, cut off the old wood, and not in heads. I find no directions as to keeping them on single stalks, but I believe this method is best. They will grow in any soil or situation, even under trees, though the open air is best. Your plantation must be renewed in seven or eight years.

CHAMOMILE, *Chamomelum*, (from *melon, gr.* an apple, because it has the scent of one,) or *Anthemis*, as its called by Dr. Linnæus. There are different species, but the *Chamomelum odoratisimum repens, flore simplici*, is the sort chiefly propagated. It is used medicinally, and in making green walks or edgings; the method of planting is, to separate the roots, as they grow very close, and prick each root into poor land, about ten inches asunder, in the month of March; they will quickly stretch themselves into contact with each other, and as the flowers ripen, they should be gathered and dried. When thick, 'tis apt to rot in the winter, so that it ought now and then to be thinned.

CELANDINE, *Majus Chelidonium*, is a medicinal herb, often cultivated in gardens. The several varieties are propagated by sowing the seed, and the plants will cast their seeds, and keep you constantly with a stock of young plants without further trouble. It is an annual celandine; the lesser is a ranunculus.

CLARY, *Sclarea*, from *Skleras, gr.* hard, because it has a hard stalk. These are propagated either from the seed in a light soil, or parting the roots and planting them out at Michaelmas, about eighteen inches asunder; these will last many years.

COMFREY, *Symphytum*, from *sun gr. cum*, and *fuo gr.* to grow to, as it is very good in healing of wounds, it being a vulnerary, is to be propagated by parting the root and planting them in the fall, eighteen inches asunder, or from the seed. Tis hardy, will grow any where, and will last long.

CRESSES, WATER, if not *sysymbrium*, grow in standing water, and may be propagated by throwing the seed in a standing water, and not cutting it the first year. From its agreeable warm taste, it is much esteemed in England, and is very good eating in scorbutic cases, and is a great diuretic.

CRESS, INDIAN, *Nasturtium indicum nasis torinentum*, because the seed when bruised is apt to cause sneezing, known to the botanists, by the name of *acriviola*, a sharp violet, should be sown in April or March, being extremely tender. If stuck, they will climb a great height, and will last till the frost come, and then totally perish. It is thought the flower is superior to a radish in flavor, and is eat in salads or without. My method is to plant the seeds in hills three in a hill, leaving a space in the middle to put the stick, on which they are to grow, and I have found they succeed very well in a rich light soil.

ELECAMPANE, *Helenium*, is a medicinal plant, the root of which is much used by the apothecaries. It may be propagated from the seeds, which are to be planted just when ripe, about ten inches asunder, and will remain in the ground till the succeeding spring when they will make their appearance, and conquer all weeds. They may likewise be propagated from the offsets with a bud at the top; they are to be put in a hole unbent, and the earth thrown over the crown of the plant with the foot; the tops are killed in winter, but they revive in the spring.

ENDIVE, *Endivia cichorium*, succory, from *Choros gr.* a place, because found every where, in order to have an early crop should be sown in the beginning of May, (though it is apt to go to seed when sown early,) and when it is large enough, which will be probably about the latter end of June, plant it out either in rich trenches as you do celery, or in beds, and when it is grown to its full size, tie the leaves up, and earth it up to the crown of the plant. In June sow more seed than July, and when fit, transplant it at about a foot distance as is before directed. When you tie it up observe that the leaves are not wet and are sound, because if tied up at that time they are apt to rot. In December and other cold months, cover the plants with pea haulm, boards or other thing that will shelter them; otherwise, the frost will destroy them. In January or February, or rather March, prick out twelve of the most flourishing plants, and they will run to seed in July, though I believe if they are permitted to stand undisturbed they will seed as well. It does not last above a month after being tied up. In February the plants should, with a flat pointed dibble, be put into the side of a trench, with the crown to the sun.

ESCHALOT, *vide cives*, under title ONION.

FEATHERFEW, *Mulricaria*, from *Matrix*, being good against diseases of the womb, or *Parthenium* from *Parthenos gr.* a virgin, is to be propagated from seed or roots; if the former, they should be sown in March, and if the latter the roots should be pricked out about eight inches asunder in May. If you do not want the seed, cut the stems off when the flowers are past, as they often decay the roots.

FENNEL, *Fæniculum*, *gr.* small hay. This may be propagated from seed, or the plants, as featherfew, and nothing more is necessary than to keep it from seeding; because it will overrun the garden, the roots being very strong, and continues a long while in the ground.

GARLICK, *Allium*, *vide* ONION.

GOOSEBERRY, *Groffularia*, by some *Uva*, and by others *Crispa*, because villose and hairy. There are many species and seminal variations amongst the species themselves to be met with, but the two sorts principally cultivated are the hairy gooseberry, and the large white Dutch. They are propagated from the suckers or cuttings, but the latter is preferable, as they produce much better roots than the former, which are apt to be woody. Autumn, before the leaves begin to fall, is the proper time for planting the cuttings out, taking the same from the bearing branches, about eight inches in length, and planting three inches deep, observing to nip off all the under branches, so as to raise it to a head on a single stalk; in October, you are directed to remove them into beds about 3 feet asunder, and having been one year in the nursery, they are to be removed to the places where they are to remain six feet asunder, and eight, row from row, observing to prune their roots, and all the lateral branches about Michaelmas. The London gardeners prune their bushes and cut them with shears into hedges; but this method is not approved of by Miller, who advises pruning with a knife, thinning the bearing branches and shortening them to about ten inches, cutting away all the irregular ones; by this culture, I doubt not the gooseberries would be as good as any in Europe. There is a small gooseberry very leafy, and which bears its leaves and fruit a long time, that is, not worth cultivation, wherefore I would advise the banishing them from the garden.

GROUND IVY, *Hedera terrestris* or *Glechoma*, will grow in any shady place, where the roots are transplanted, and will overspread the ground if not restrained.

HORSE RADISH. *Cocklearia, from Cockleare, lat:* a spoon, because the leaves are hollow like a spoon, is a species of the scurvy grass. It is to be propagated from buds or cuttings from the sides of the old roots, in October or February, the former for dry land and the latter for moist. The offsets should have buds on their crowns, and the heads planted out should be about two inches in length. The method of planting them is in trenches about ten inches deep, about five distance each way, the bud upwards, covering them up with the mould taken out of the trenches. Then the ground is to be levelled with a rake, and kept free from weeds, and the second year after planting the roots may be used; the first year the roots are very slender. When you have cut from a

root, and separated as much as you have occasion for, put it into the ground again with the head just above the earth, and it will restore itself, if not pulled up soon after. It ought to be planted in very rich ground, otherwise it will not flourish. This method of planting I am so well pleased with that I never had any horse radish in my garden, till I strictly pursued it, and I advise every one to follow it.

HONEY-SUCKLES, *Caprifolium*, because the goats eat the tender plants. The red is the Italian, the pale, English; roots or cuttings will produce it. They may be removed in bloom for the sake of a prospect, and replaced when out of bloom.

HYSSOP, *Hissopus*, is a purging or cleansing plant, for in the Psalms it says, "purge me with hyssop," and though the hyssop of the ancients we are in some respect unacquainted with, yet we have reason to believe it was a low plant, for Solomon is said to have described all plants from the cedar to the hyssop. If propagated by seed, they should be sown in poor dry land in March, in beds, and when fit should be transplanted where they are to remain about two feet asunder. If from cuttings, they should be planted out in April or May, in a border defended from the heat of the sun. It is a hardy plant, and if not in dunged ground, which makes them luxurious and feeble, they will resist the severest weather. The winter is thought to be the ancient hyssop, because it is much demanded, and used in the eastern countries, in washings and purifications.

LAVENDER, *Lavendula, a lavendo*, because good in washings and bathing, as it scents the water and beautifies the flesh, should be propagated from the cuttings or slips, and planted out in March in a poor gravelly soil. It has been found that this soil suits it best, will give it more aromatic smell, and that it will resist the winters here better than in a rich soil.

LETTUCES, *Lactuca*, from *lac*, milk, they being of a milky substance which is emitted when the stalk is broke. There is a common garden lettuce which is sown for cutting young and mixing with other small salads, and is the cabbage lettuce degenerated, as all seed will do that is saved from a lettuce that has not cabbaged closely. These may be sown at any season of the year. The cabbage lettuce should be sown every month, to have a succession, and drawn as all the sorts ought to be, to stand at different distances, and these should stand at about ten inches asunder, and by replanting those that are drawn, they will head later than those which stand, by which means you may have a succession. This sort of lettuce is the worst of all the kinds in my opinion. It is most watery and flashy, does not grow to the size that many of the other sorts will do, and very soon runs to seed. When I say the seed is to be sown every month, I mean only the growing months, the first of which February is esteemed, and August the last. In August you should sow your last crop, about the beginning of the month, and in October, transplant them into a rich border, sheltered from the weather by a box with a lid, which should be opened every morning and closed in the evening; and in the month of February you will have fine loafed lettuces. Lettuce is a hardy plant, particular the Dutch brown, and will stand most of our winters, if covered only with peas or asparagus haulm, mats or straw. In order to have good seed you should make choise of some of your best cabbaged and largest plants, which will run up to seed, and should be secured by a stick, stuck into the ground; and different sorts should not stand together, for the *farina* will intermix and prejudice each other, and none but good plants should be together for seed; experience has shown that the bad will vitiate the good, and the seed from the plants that have stood the winter are best. The seed is good at two years old, and will grow at three if carefully preserved.

The CILICIA, imperial white, and upright *Cos Lettuce*, should be sown in February or beginning of March, and should be drawn so as to stand, Miller says, 18 inches at least distance from each other, but thinks two feet much better.

The EGYPTIAN green *Cos*, and the *Versailles* upright *Cos* and *Cilicia*, are most esteemed in England as the sweetest and finest, though the imperial wants not its advocates. I, for my own part, give it the preference for three reasons, the first is, that it washes by far the easiest of any. Second, that it will remain longer before it goes to seed than any other except the Dutch brown; and lastly, that it is the crispest and most delicious of them all.

The DUTCH BROWN, and green capuchin, are very hardy, will stand the winters best, and remain in the heat of summer three weeks longer than any before they go to seed, which renders them valuable, though they are not so handsome or elegant a lettuce as any of the former. They may be sown as the common garden lettuce in the spring, and in August as before.

The ALEPPO and ROMAN lettuce cabbage the soonest of any, and may be propagated for that reason; the first is a very spotted lettuce. Col. Ludwell gave me some of the seed, but it did not please me so well as the other more common sorts; all the seed on a stalk will not ripen at the same time, so you must cut your stalk when some of the first seed are ripe. Mice are very fond of the seed. Some lettuces show a disposition to head without assistance, these should not be touched, but where they throw their leaves back they should be tied up, though that restrains them from growing to a great size. They will not flourish but in rich land, and if dunged, the dung should not be very low, because the root of a lettuce will not go down so low as the dung is commonly spitted into the ground. The time for gathering the seed is when the plants show their down. Transplanting it is said contributes towards cabbaging, but they will cabbage, from my experience, every bit as well without. By transplanting you retard the growth, and by that means may have a succession.

MARJORAM, winter, pot, and wild, *Origanum*, from *Oros gr.* a mountain and *ganumai gr.* to rejoice, because it delights in a mountainous soil.

This may be propagated either from the seed, cuttings, or parting their roots in the spring, and if kept clear from the weeds, will stand a number of years.

MARSH MALLOW, *Althœa gr.* from *Althos gr. medicament.* These may be raised from seed sown in March, and transplanted into pots or elsewhere, or from cuttings planted in May, in a light soil and shaded.

MINT, *Mentha,* from *mens,* the mind, because it strengthens the mind. These should be planted in the spring, by parting the roots or cuttings, and planted six inches asunder; otherwise the roots mat into one another and destroy themselves in three years.

MELONS, from *Mœlon gr.* apple because of its fragrancy. The Italians call it *milo,* from *mille* a thousand, because not one in a thousand is good. There are but three sorts of melons that Miller says are worth cultivating, the Portugal or pocket melon, which is small and round, the Cantaleupe melon, and the Zatta melon; the green fleshed melon, and the netted wrought melon, he does not esteem, though I have found them very delicious in this country. There is a rough knotty melon called the Diarbekr, from a province belonging to the Turkish empire in Asia, which is reckoned the most exquisite of all melons, which have been brought to great perfection here, and which are not taken notice of by Miller, probably because it has been brought into England since the publication of his dictionary, unless it is the Zatta melon. The Portugal melon has been called by the name of King Charles' melon, because he used to carry one in his pocket, and also Dormer's melon, because brought from Portugal by a general of that name. The Cantaleupe originally came from Armenia on the confines of Persia, but took its name from Cantaleupe, a province about six miles from Rome, where they produce the best. It is known all over Europe, by the simple name of the Cantaleupe melon, and agrees with all stomachs and palates. The Zatta melon is greatly esteemed in Florence, Italy, &c. It is small, deeply furrowed, rough and warted, and compressed at the ends. Melons should never grow near one another, if of different sorts, or by any means near gourds, cucumbers, &c. because the farina of one will impregnate the other, spoil the relish of the fruit, and make them degenerate. Melon seed should not be sown before three years old, and though they will grow at ten or twelve years, yet they should not be propagated after six years. The early melon is of little value; the middle of June is early enough. In order to have a proper succession, the seed should be sown at least at two different seasons, about the middle of February if seasonable weather, if not, the latter end. The second sowing should be in March, and the third in May which last will yield a crop in August, and last till October. The early sowings should be covered with oil-paper in preference to glasses. The culture of melons and planting them out is the same with cucumbers, to which we refer. The compost used by the Dutch and German gardeners, for melons, is of hazel loam, one-third part, of the scouring of ditches, ponds, &c. the same, and a third part of rotten dung all mixed together, and mellowed by being frequently turned over and kept twelve months. But Miller prefers two-third of fresh gentle loam and one-third of rotten neat's dung, kept together a year, and often turned. It will take about fifteen good wheel-barrows of dung to a light. Melons of all sorts, but particular the Cantaleupe, should be planted out as soon as the third or rough leaf appears. These seeds do well to be sown on the upper side of a cucumber bed. One plant is enough for a light. Watering is very requisite, but in much smaller quantities than for cucumbers, and the water should be laid on at a distance from the stems. When the plant has four leaves, the top of the plant should be pinched off, in order to force out the lateral branches. It must not be cut or bruised; that wounds the plant, and takes a considerable time to heal. The roots of melons extend a great way, and often perish after the fruit is set, for want of room; wherefore Miller advises that your beds be twelve feet, and when your frames are filled with vine, to raise it so as to let the vines run under them. When the lateral branches, or, as the gardeners call them, runners, have two or three joints, their tops should be also pinched off, and when your fruit is set, examine the vines and pull all off, except one to a runner, leaving at most about eight to a vine, and pinch off the end of the runner about three joints from the fruit; notwithstanding these are pinched off, there will new runners appear, and these should be also taken away. If the ground is not too wet and moist, the lower the plants are the better, and if you plant in a bed, let your trenches be extended in length about three feet and a half wide, and your plants should not be less than five feet asunder, to prevent their vines intermixing. If there are several beds they should be eight feet asunder and the spaces between filled up, for the benefit of the roots, with rotten dung. They ought to be covered in all hard rains. The frames should not be too heavy. Many use laths in imitation of covered waggons. Your fruit should be turned twice a week, for the advantage of the sun, and if lodged on a board or piece of tile, it will be better. Once a week watering will be sufficient. The sign of the fruit's maturity is the cracking near the foot stalk, and smelling fragrantly. The Cantaleupe never changes color, till too ripe. Gather your fruit in a morning before the sun has warmed it, but if gathered after put it into cold water or ice, and keep those got in the morning in the coolest place. A few hours delay in gathering will spoil the fruit, wherefore they ought to be overlooked twice a day. Take your seeds from the richest flavored fruit with the pulp, in which it must lie three days before being washed out, and save only the heavy seed, that which will sink in water.

MILLET, from *Mille,* a thousand, from the multitude of seed it bears. There are four sorts, white, yellow, black, and the Sorgo or Guinea corn. It originally came from the eastern countries, and is much esteemed in making puddings. The seed should be sown the middle of March, very thin, as the plants require room, in a warm dry soil. They should be kept clear of weeds, and in August or latter end of July the seed will ripen, when they are to be beaten out. The seed is good for poultry. The black, sort so called from its black seed, is of no use or value.

MULLIN, *Verbascum, quasi barbascum*, from the leaves being rough and bearded. By others it is called *Candele regia Lychnitis*, because its leaves are used instead of cotton in a lamp. And it is also called *Phlomos gr.* from *flego gr.* to burn for the same reason. The seed should be sown in August, in drills, each seed about six inches asunder, and in the spring transplanted in a warm light situation.

MUGWORT, *Artemisia* wife of *Mausolus*, king of *Caria*, who first brought it into use, or *Parthenis* as it was before called, because supposed that a virgin goddes, gave name to it; or *Artemis gr. Diana*, because good for the disorders of women. This plant is propagated by parting the roots, either in spring or autumn, and will grow in any soil or situation. They spread very much, to prevent which their side shoots should be cut; from one species of this the moxa is got, being the Lanugo or downy substance under the leaf.

ONION, *Cepe*. There are three sorts for winter use; *cepe oblonga*, or Strasburg, *vulgo cepe vulgaris, floribus and tunicis purpurescéntibus* or red Spanish onion, and lastly *cepe floribus* and *tunicis candidis*, or the white Spanish onion, by some the stomers. There are other sorts which suit the spring and summer seasons best, those are *cepe ascalonica*, from *Ascaton*, a city in India, or the scallion or escallion. The cives or cepula the young onion. The Welsh onion, and lastly the *ciboule*. The three first sorts should be sown in February, the first open weather, or beginning of March at farthest, and in about six weeks your onions will be up, and ought to be weeded. The rows should be about 12 or 18 inches asunder if sown in drills, which is the best method, and the plants should be drawn to be about 5 or 6 inches apart. This may be no loss, because they will serve with young salad in the spring. About the middle or latter end of July your plants will be ripe, which may be discovered by the dropping down or shrinking of the blades, then they should be drawn up, and the extreme part of the blades should be cropped off, and the plants laid on the ground to dry. They should be turned at least every other day, otherwise they will strike fresh root, especially in moist weather. In about a fortnight they will be sufficiently dried, you are then to rub off all the earth and take care to remove all that are any ways decayed, and the sound ones laid as thin as possible, in some room or garret as close from the air as possible, and at least once a month look over them, to see if any of them are decayed, for if any are so, they will affect the rest, or if too near one another, or in heaps, they will heat and probably ruin the whole crop. The white onion is the sweetest, though all the three sorts will degenerate into one another in the course of time. In March you should dig a trench, and put some of your most flourishing plants about six inches deep, and as far asunder, into it, which should be covered over with a rake, and in about a month's time the leaves will appear above ground, and when your plants begin to head, they should be supported by stakes and pack-thread or yarn, otherwise they will be very liable to be injured by the winds. These will produce your seed, about August, which may be known by the seeds changing brown, and the bells where the seed is contained, opening. The heads should be critically cut, otherwise the seed will be dropped, and when cut, the heads should be exposed to the sun, and sheltered in the night and wet weather; and when sufficiently dry they should be rubbed out, and after being exposed one day more to the sun, may be put into bags and preserved for the following year. The scallion is a small onion, and is sown early in the spring, and never forms any bulb, and is used green in the spring with young salads. The ciboule and Welch onion are thought to be the same by Mr. Miller.

The CIVES never grows into bulbs, but in bunches, and Miller takes it to be shalot. They don't grow above six inches high in the blade. They are to be propagated by parting the roots or planting the cloves. They don't effect the breath so much as the other sorts. The Welch onion at some seasons of the year (viz: in the fall) dies away, but revives in January, and becomes very early in the spring fit for the table.

GARLICK, *Allium* from *Aleo gr.* to shun from its scent, should be propagated by planting the bulbs in August or September, about 5 inches asunder. These die about July, and then should be taken up and hung in a dry room for winter use. All these several sorts delight in a rich sandy soil, and eight pounds of seed will sow an acre. When sown, they should be trod; so should they be treated when they run too much into blade, in order to throw their substance into the bulb, and when trod they ought to be covered with fresh mould. The seed for sowing should never be wet, because it will shoot out its radicle, and never succeed afterwards.

PARSLEY, *vide* CELERY.

PARSNIP, *Pastinaca* from *Pastus*, fed, because its plant is edible. The seed should be sown about February or March, in light ground dug pretty deep, and may be mixed with carrots; though Miller advises against mixing with any thing else, because, they spread very much in the latter end of summer. They should be kept very clear of weeds, and should be drawn to about 10 or 12 inches asunder. When the leaves begin to decay, which will be about February, after frosts, they should be dug up and put into dry sand, which will preserve them till April. They are not sweet till bit by the frosts. In order to have seed, your strongest plants should be planted out in the spring, and in August or beginning of September your seed will be ripe. You must then cut off the heads, and let them be exposed to the sun three days, in order to dry them, after which they should be beat out, and put up for use. Seed are not to be trusted after a year old.

PEAS, *Pisum*, from *Pisa* a city, where it anciently grew in great plenty, or from *Pesen gr.* he fell, formed from the verb *Pipto gr.* because this plant, if not supported, will fall to the ground. There are several sorts of pease, and which have different properties, some being early, and others late. There are the Charlton-hotspur, Reading-hotspur, and master-hotspur, but are very little different from each other. These are the earliest, and are reckoned much preferable in flavor to any other kind. These should be sown in November,

and covered in the winter. There are likewise the rouncivals, the Spanish maratto, and the marrowfat or Dutch admiral, but these are of a later sort, and are intended to come in succession, when the forward kind are gone. You should sow your peas every fortnight, and as the hot weather comes on, the latter sort should be in a sheltered situation, otherwise they will burn up. I would recommend sowing in drills about 2 or 3 inches deep, levelling the ground very smoothly with light mould, in rows about four feet asunder, for the convenience of going between to gather the crop, and raising cabbages or other things at the same time. In the spring let your rows be east and west, in the summer north and south, for a reason which must be obvious, viz: the giving them as much sun as possible in the first instance, and as little as possible in the last. When your peas are well up, they should be hilled once or twice before they are stuck. This not only strengthens them, but at the same time affords them fresh nourishment. The manner of sticking them is known to every body; I shall only, therefore, mention a caution, to put your sticks firm in the ground, otherwise they are apt to fall when the vines grow rampant, and not to stick them in too near the roots, lest you do the plant irreparable injury. In the spring it has been found that scattering some dry cow dung in the trenches before you sow your peas, has been very beneficial. The charlton and marrowfats may be sown at the same time. Some people soak their peas before sowing, but this often turns out unsuccessfully, for in a wet season they are very apt to rot. There is a pea which came from Holland, with an esculent husk. The ormonds are the hotspur. In order to have peas in the fall, sow the hotspur and a latter sort the 12th day of August, these will yield you a crop from October till the intense weather comes on, in November or December. Your sticks should be pretty long, eight feet is not too high, because the rampant sorts, particularly the crown pea and marrowfats, run to a great height, and keep bearing as they grow. Peas may be preserved as kidney beans are, by laying them in different layers of salt, in their pods, and keeping them quite close.

Potatoes, *Licopersicon*, from *Lupus*, *gr.* a wolf, and *porsica*, a peach. Potatoes seems only a corruption of the Indian batatas, it coming originally from America, in 1623. Dr. Linnæus classes it under the genus *solanum*. There are more raised near London than in any other part of Europe. As the seed is not only uncertain, but very difficult to be raised in England, they are generally propagated from the roots; some take the small potatoes, or offsets entire, others cut the large ones into pieces, observing to plant what they call the eyes. But Miller thinks the best method is to plant the fairest roots, allowing them a greater distance both in the rows, and from one another. The proper soil for this plant is a light, sandy loam, not too dry or moist. The ground should be well worked, and your potatoes planted as soon as the frosts are over, that is, about the beginning of March, in furrows about seven or eight inches, and the rows three feet asunder, and the plants a foot and a half. The ground should be kept clear of weeds, and stirred before the roots begin to stretch themselves out. The haulm of these plants are generally killed the first frost, at which time they should be taken up, and kept in sand quite dry, for use, not too thick, and very dry, least they should heat and spoil. You may dig them up sooner, if large enough, and no injury will be done. This is the case amongst the farmers, for they generally take a crop of wheat from the land, and therefore, must have the ground cleared as soon as possible. The Irish method of raising these plants, is to lay them on the sward, and cover them six inches with mould, and so hill them up as they grow. Hilling is necessary, let them be planted in any manner you think proper.

Pepper, *Capsicum*, from *Capsula*, or *Kapto gr.* to burn, should be sown in April, and should be gathered before the pods grow hard, for pickles.

Radish, *Raphanus*, from *Radios gr.* easy, and *saino gr. appareo*, because they soon make their appearance when sown. There are radishes known in this country by the name of scarlet or salmon, London short-topped, &c., but they are, Miller says, no more than little varieties of the common sort, arising from culture. The gardeners about London sow their seeds in October, in a warm border, so as to have them, if they do not miscarry, in March; but I believe our winters are too severe to admit of this here. The second sowing is about Christmas, which will produce a crop in April; but the best method is to sow every fortnight, from January till the beginning of April, always observing to sow your latter crops in moist land, otherwise they are apt to run up; and indeed, with proper shelters, these sowings may be repeated all the summer and fall. Where the ground is scarce, the gardeners sow carrots and spinach with their radishes, because the last are drawn soon, and give the others room to flourish. The best method of sowing radishes is in drills about a foot asunder, the seed to be put three inches deep in light rich land, though no dung; and if they grow too thick, that is, nearer than three inches asunder, they should be pulled, so as to remain within that distance. In May, you should, in order to have proper seed, draw some of your best plants, such as do not branch, but are straight, and prick them in rows three feet asunder, and two from one another, and when the seed grow brown, they should be taken off, dried, and the pods beaten out, and secured so that the mice cannot get at the seed. There is a turnip-radish, being very like one called in England, the round-rooted radish. These should be sown in March, and allowed a greater distance than the common radish. The black radish will continue, if sown in August, till killed by the frosts; and radishes may be preserved in sand, as carrots are, till the spring. Some people, to have long handsome radishes, make holes in the ground at six inches deep, and put two seed into each, about three inches asunder, by which means your radishes are the better.

Raspberry, *Rubus*, being red. There are two sorts only that are propagated for the sake of their fruit, the white and red, and those either by layers or suckers, though the former are preferable. They should be placed in some abject part of the garden, where they may have room to spread without incommoding any other plant. They should not be less than two feet asunder, and in their rows five, though six each way would do better, in a

light loamy soil, neither too moist or too dry. The old bearing branches should be cut down to the ground in October, and the young shoots shortened to two feet, and some rotten dung should be thrown into the trenches. There ought to be a new plantation once in three or four years. Some think they should never be touched, but be suffered to run and grow as they please; others pinch off the dead parts only. If the blossom is pulled off they will produce fruit in the fall. They are pestered with lice, but lime water kills them if sprinkled upon them.

ROSEMARY, *Rosmarinus*, sea dew, delights in a poor gravelly soil, and has a more aromatic smell than in richer soil, and will stand the cold better. It is propagated by cutting or slips, which may be planted either in the fall (September,) or in the spring, and transplanted where they are to remain after they have taken root; or they may be suffered to remain where the cuttings are first put.

RUE, *Ruta*, from *Ruo*, *gr.* to preserve, viz. health. It is propagated as rosemary, to which we refer, only it must be done in the spring. It is not good for edgings, to which use it was formerly applied, because it either grows too luxuriant, or if repressed, ragged, wherefore it is now discontinued, and made use of only for medical purposes.

SPINACH, *Spinachia*, should be sown about the latter end of July or middle of August, when there is an appearance of rain, and drawn, when up, to be about three or four inches asunder. It should be constantly cleared of weeds. In October the spinach will be fit to cut, when you should only crop the largest leaves; in the spring you should sow a fresh crop, which will come to maturity in April, when the winter sowing will run to seed, and the best plants should be reserved for seed. In England they aim at a succession, and sow in January, February and March; but in this country it is apt to run to seed in the spring, and if prevented, is milky and distasteful. The seed should be sown in drills about two feet distance, and if you desire seed, the plants should be about twelve or fourteen inches asunder. Seed sown in the spring will produce as good seed as any. There is a male and female plant, the former of which produces spires of stamineous flowers, which contain the farina, and impregnate the embryos of the female plants, and produce the seed; and if the males are pulled up the seed will not be worth any thing. When the plants change color they should be cut and dried a few days in the sun, turning them every day, and when dried, beat out and preserved from mice. It delights in the best soil.

STRAWBERRY, *Fragaria*, from its aromatic scent. There are three sorts chiefly progagated, the wood, the scarlet or Virginian, and the hautbois; there is a green sort, which some call drayton, and others, the pine apple, from its participating of the flavor of that delicious fruit, but none has ever been brought into this country, and it is but rarely to be met with even in England. September is the best month for transplanting, though it is often done in February. But I have myself transplanted with success when in full bloom. The soil this plant delights in ought to be a fresh loamy sort. If too rich, the vines grow rampant, and do not produce the fruit so good as in ground less enriched. All strawberries should be at least a foot distance, but I recommend two feet, to have them in great perfection. They ought to be planted in beds, with alleys two feet wide, for the convenience of going between to cleanse them of weeds, very prejudicial to them. In the spring, when your vines are in flower, if it is dry, water them, otherwise their blossom will drop off. In September you should pull off all the strings, or runners, and every weak plant; dig up between the beds, and strew some fine mould or wood-pile earth between the plants, observing not to cover them with it; this will greatly strengthen them, and your fruit will be much larger. They do not last above three years, so that to keep constantly supplied, you should make a new plantation a year before the old ones are destroyed. The scarlet strawberry will come a fortnight sooner than any other sort. The Chili strawberry will grow to the size of a hen's egg. The best dung (if any,) for strawberries, is that of cows, sheep, and pigeons. In order to have them later in the season, and to afford a succession, cut off the tops of some before they blossom, which will retard their ripening till the forward ones are gone. Many people keep them constantly strung, but I should imagine that wounds them, but in the proper season. It is thought a clayey soil suits them best, because the best are found at Hammersmith, where the best and most bricks are made. Ashes, if not in too great a quantity, (for they are then too hot,) suit them very well.

SAGE, *Salviæ*, *salus vitæ*, may be propagated in any of the summer months, if watered and shaded till they have taken root. It delights in a dry poor soil. There are fifteen different sorts, but the common or green, and the red are principally cultivated. The broad leaved sage is preferable for tea.

SALSIFY, or goats' beard, *Tragopogon*, sow in March or April, in rows a foot asunder, keep the plants six inches distance, and take them up when the leaves decay.

TANSY, *Tanacetum*, is propagated from the creeping roots which shoot out if undisturbed, and may be planted in spring or autumn, at about a foot distance. The paths round the bed should be often dug, in order to keep the roots within bounds.

THYME, *Thymus* from *Thuos gr. odom* or *Thumos gr.* animal spirit. This is to be propagated either from the seed, or parting the roots. If from the former, the seed should be sown in March, if from the latter, the slips from the roots should be planted the latter end of the same month, about six inches distant. This plant impoverishes the ground much, for nothing will succeed in land where thyme has grown the preceding year.

TURNIP, *Rapa*. The white and purple rooted turnip, are the two sorts chiefly cultivated in England for the table. They delight in a light sandy soil, and not rich, for that makes them sticky and rank. Fresh land suits them better than land worn out, and will communicate to them a sweeter flavor. The gardeners about London, sow their seed successively from March to August, for the market, though such as are sown early are lia-

ble to be eat by the fly in dry weather, wherefore it is advisable to water. But the farmers sow from June to the middle of August; after that time they will not apple kindly, and if you intend your crop for the table, in the summer it would be proper if possible, to put your seed into a moist soil, and in some open place not near hedges, &c. It is said they are a great improvement to barren land. The ground intended for this purpose should be well worked and made as fine as it can be, and if you sow a large quantity, it should be in drills very thin, the common allowance being one pound to the acre, though two are very sufficient, and should be harrowed in, and rolled in order to break the clods, and in ten days your seed will come up. When your plant has four leaves, your ground should be hoed, and the turnips pulled, to be about six inches asunder, and about three weeks or a month after they should be hoed a second time, and left within eighteen inches, or two feet; for what they want in number will be sufficiently compensated in weight. Ten inches are a sufficient distance for roots intended for the table, because the largest are not generally esteemed the sweetest. It is but of late years, that turnips have been sown in the fields for cattle, and yet it was practised by the ancients, for Columella recommends the sowing the rape for cattle. In many parts of England, at this day they are ignorant of the method, for they sow their seed with barley in the spring, and when the barley is cut, the turnips afford the sheep something green to pick up. The proper method of sowing turnips in the field is with the drill plough, in rows three, four, five, and six feet asunder, the last is most recommended. Lord Townsend sowed an acre in drills, and worked it with the plough, and another acre in broad cast and hoed by hand, and the turnips sown in drills; yielded a ton and a half in weight more than that which was sown in the other husbandry. The great danger turnips are liable to, is from the fly, in dry weather, when the leaf is tender and smooth, wherefore you ought to sow a little soot along the drills, which will keep the fly off, till the rough leaf comes on, and then the fly wont touch it. Caterpillars sometimes attack these plants when they have surmounted the enmity of the fly, but some hungry poultry turned into the turnip field or patch in a morning, will soon get it rid of these insects. Miller recommends feeding cattle or sheep on turnips, within hurdles which should be removed every day, otherwise they will destroy a great quantity more than they can eat. The best mutton in England is fed on turnips, and tis a vulgar mistake to say it makes it rank. In order to save seed, some of the fairest plants should be transplanted in February, about three feet asunder each way.

A GARDENER'S CALENDER.

January. Prepare hot-beds for cucumbers; as little can be done this month in a garden, I would advise the preparing of your dung, and carrying it to your beds, that it may be ready to be spread on in February.

February. Sow asparagus, make your beds, and fork up the old ones, sow sugar loaf cabbages; latter end, transplant cauliflowers, sow carrots, and transplant for seed, prick out endive for seed, sow lettuce, melons in hot beds, sow parsnips, take up the old roots and prick out for seed, sow peas, and prick them into your hot beds, sow radishes twice, plant strawberries, plant out turnips for seed; spade deep, and make it fine, plant beans.

March. Slip your artichokes, if fit; plant kidney beans, cabbages, celery, parsley, cucumbers, currants, chamomile, celandine, nasturtium, featherfew, fennel, ivy, horse-radish, hyssop, lavender, lettuce, radishes twice, marjoram, marsh mallow, mint, melons, millet, mugwort, onions and for seed, peas twice, potatoes, raspberry, rosemary, rue, spinach, tansy, thyme, turnips. You may begin to mow your grass-walks, and continue so to do every morning, and roll them; turf this month, and plant box.

April. If artichokes not slipped last month, do it this; plant bushel and garden beans, sow cabbages; 12th, sow cauliflowers; sow celery, cresses, nasturtium, lettuce, peas, sow radishes twice; sage will grow in this or any other month; turnips, sow salsify early, pepper. Turf this month.

May. Latter end, broccoli, celery, cucumbers for pickles, endive, featherfew, hyssop, cuttings of marsh mallow, melons, peas, sow radishes twice, kidney beans. Turf this month.

June. Cabbages should be sown, sow radishes twice, transplant cabbages, prick out cauliflowers, do. broccoli. Draw up by the roots all your weeds.

July. Transplant broccoli, sow cabbages, coleworts, transplant cauliflowers to stand, endive, gather millet seed, take up onions, sow radishes, twice, sow turnips, plant kidney beans to preserve.

August. Sow cabbages; latter end, carrots, get your cucumber seed, sow cresses, prick out endive, early sow lettuce, mullein, gather onion seed, plant garlick, get parsnip seed; 12th sow peas for the fall, sow radishes; middle, sow spinach, though some say not till after the 20th; sow turnips.

September. Sow cabbages; 10th, sow cauliflowers; plant cuttings of currants, clary comfrey, plant cuttings of gooseberries, sow radishes, plant layers or suckers of raspberries, rosemary, plant out strawberries, string your strawberries, and dress your beds, plant tansy.

October. Latter end, cut down your asparagus, and cover your beds with dung, plant beans for spring, sow cabbages; 20th, transplant cauliflowers, plant horse radish, prick lettuce into boxes, sow peas for the hot bed, radishes; turf this month.

November. Take up your cabbages, sow cabbages, take up your cauliflowers, such as are flowered, and house them, take up your carrots, trench all your vacant land, prune your trees and vines, plant out every thing of the tree or shrub kind, that has a root to it; if any thing is done to your artichokes, this is a good month; plant box; turf early.

December. Cover your endive with brush, cover celery, and every thing else that needs shelter,

if the weather will admit, turn over your ground that is trenched, in order to mellow it, and pulverize it. Whatever will prevent delay and enable you to begin spading in February, should be done this month.

From the Silk Grower.

A STATEMENT OF PRACTICAL SILK BUSINESS.

To the Committee on Silk, American Institute:

Gentlemen—The vast importance of the silk culture to our country, and the eagerness of the public to obtain information respecting it, make it the duty of every one engaged in producing a "silk crop," to furnish his quota of knowledge, that thus a mass of practical information may be collected, from which we may go forward with confidence, and gather in the rich harvest which is before us.

With these views, and in compliance with the solicitation of my fellow-citizens, I give you the result of my experience during the past summer. I would first premise, that in making a trial of the silk culture, it was my desire to adopt a mode which could be followed by our agriculturists at large, rather than to show the greatest possible quantity of silk that could be produced from a given portion of land. Such an experiment, made under peculiar advantages of soil and culture, yielding a large product, might be viewed with admiration; but the means being beyond the reach of the mass of our citizens, the same results could not be attained.

The field from which the experiment was made, was situated in East Hartford—the soil, of a light, sandy nature, of a quality termed in that quarter, good corn-land. It was ploughed about the middle of May, and harrowed and furrowed in the usual manner. The roots and trees (morus multicaulis) were now laid down and covered from two to four inches, the tops having a slight upward inclination; they were placed about twelve inches apart in the row, the rows three and a half feet apart, having been previously moderately manured.

After the field was planted, a section comprising one eighth of an acre was marked off, to be subjected to a more particular experiment. It was stocked with 780 roots and trees, all of one year's growth, having had their tops partially or wholly killed by the severity of the past season. One-third were two feet high, one-third one foot, stripped of their limbs, and the remainder were roots without tops. By the 1st of June the new shoots began to show themselves, and by the 1st of July they numbered 4,800, and had attained the height of twelve to eighteen inches.

A family of 4,000 worms were now started, which wound up on the 23d July, having consumed 131 lbs. leaves. Three other lots, amounting in all to 28,000, were now put out at intervals of several days, in order to favor the increasing growth of the leaves. By the 10th of Sept., the last had finished their labors. Weight of leaves consumed in Aug., 701 lbs. and in Sept. 332 lbs.

Total weight of leaves gathered, . .	1,164 lbs.
Total number of worms fed, . . .	32,000
Producing nine bushels cocoons.	
Yielding (so far as reeled) 1 lb. of silk per bushel.	
Weight of cocoons, ...	95 lbs
Waste silk, and floss, ...	1 lb.

Twenty-seven thousand of the worms were of the two-crop kind, requiring 4,000 to make a pound of silk and consuming 144 lbs. of leaves. The remaining 5,000 were the long-crop six-weeks worms, 2,500 of which produced a pound of silk, and consumed 90 lbs. leaves. It was my intention to have fed the long-crop worms entirely, as they are known, to be much the most productive of any other kind, but they could not be procured.

Business now calling me away, the feeding was discontinued, and the trees were immediately removed from the ground, having attained an average height of 4½ feet, well-rooted, and with heavy limbs.

The produce of the one-eighth of an acre, as above, it appears is 9 bushels cocoons or 9 lbs. silk; being at the rate of 72 lbs. per acre, from the feeding between the 1st July and the tenth Sept. It is easy to see, that had the 1,164 lbs. leaves been fed to worms of the six-weeks kind, the yield would have been 13 lbs. of silk, or nearly—and from the rapidity with which the new leaves were developing when the trees were removed, it is presumed that had they remained during September, enough more might have been added, to have swelled the product, so as to have made the crop at the rate of 125 lbs. per acre.

During the period of feeding, the safety and even advantage to the tree of frequent defoliation was fully proved. The trees from which this experiment was made, were stripped of their leaves four different times, yet at no time were they inferior to others that were untouched; on the contrary, it was remarked, that where the leaves were removed, the limbs shot forth with greater vigor--care being taken to leave the tender leaves at the ends of the branches.

The very great advantage of this species of mulberry over standard trees, was manifest; while such trees are difficult of success, and from the small size of the leaves, requiring much labor to gather any quantity, it was easy for a child to take from the morus multicaulis 15 to 20 lbs. in an hour.

The plan of retarding the hatching of the eggs by keeping them in an ice-house, was found perfectly successful; the worms which wound the finest cocoons were thus kept back until the 3d of August.

It may be useful to new beginners to know, that the large six-weeks worm, either white or sulphur colored, is altogether preferable to the two-crop; for not only are they more productive of silk, but from their superior length of thread, the reeler is able to produce silk of better quality, and with less labor.

The convenience of a shrub tree, where the farmer wishes to change his crop, may be seen from the fact, that with the use of a plough, the trees on this section of land, 4,800 in number, were turned out of the ground in 30 minutes. An hour more was sufficient to cart them from the field.

Every one who takes up the culture of silk, is surprised at the ease and certainty with which it is produced, and of this experiment it may be observed, that none of the persons who took care of the trees, gathered the leaves, or fed the worms, had ever seen a tree or silk-worm before.

I am not acquainted with the comparative merits of the morus multicaulis, and other kinds of the mulberry; but large as has been the estimate of some cultivators, of the produce and value of

the former, I believe its astonishing power of reproducing foliage, its tenacity of life, and the great ease with which it is multiplied, have never been overrated. A friend informs me that a field of roots, deprived of their tops last fall, remained in the ground during winter, and that from the new shoots, which started as early as any other vegetation, he was able to feed from one to two months earlier than from others planted the following May. From these collected facts, we may form an idea of the quantity of leaves, and the consequent weight of silk that may be obtained from the morus multicaulis, when it shall have attained greater age, even in this latitude.

I am not able to name the cost of raising silk; but an intelligent culturist of my acquaintance, from a proof of three successive years, rates it at $2 per lb., exclusive of the cost of trees and the tillage; respecting the latter, I am of opinion the labor bestowed on a field of mulberry, need not be more than on a field of Indian corn.

It appears, therefore, that nearly all the labor of raising silk, viz: plucking the leaves, feeding the worms, and reeling it into sewings, may be performed by the females of a family, and thus the product be considered a clear gain, like that of any other collateral branch of farming. The growing of silk needs but to be looked into, to be appreciated; and if 100 pounds can be produced the first year of planting, worth $5 the pound in raw silk, or $9, when in sewings, what other crop, it may be asked, can be named coming near it for profit?

I will only add, gentlemen, that it is cheering to see the interest the American Institute has taken in this all-important subject, and to express the hope, that the coming exhibition, from our silk-growers, and the increased patronage of the institute, may give to it a fresh interest.

Yours, respectfully,

J. DANFORTH.

Hartford, Con., Sept. 19th, 1838.

To the Committee on Silk, American Institute:

Gentlemen—The accompanying sewing silk, 3½ pounds, is offered for exhibition at the coming fair; and you may consider me a competitor for the premium offered through the Institute in April. This silk was produced from $\frac{1}{16}$th of an acre of land, being one half the section named in the statement annexed. It should be remarked, that the cocoons (4½ bushels) from which it was produced, were sent some 40 miles to be reeled, and consequently were much injured, so as to produce less silk; and from haste in reeling, (to prevent *all* the millers from eating out,) is inferior in quality to what it would otherwise have been. Weight of waste silk and floss, 1 lb.

Yours respectfully,

J. DANFORTH.

For the Farmers' Register.

SKINLESS OATS.

Wardsfork, Charlotte, Jan'y 16, 1839

About three years ago, you enclosed me twenty grains of skinless oat seed; I drilled them carefully, and made a half bushel in the shuck. I sowed them, and they turned out well; from which I made a large stack last year, all of which I intend to sow this spring. I am very much pleased with the oats, notwithstanding they have been repudiated by some writer in the Register, some time ago. If I succeed well with this crop, I will give you a particular account for the Register. I am satisfied now, they are a valuable oat. But, as they have been condemned, I wish to make a full trial of them. R. J. GAINES.

[The success of the trial, so far, is, of itself, a valuable report, and, therefore, is here given to encourage other experiments. The more full future account will be still more acceptable.—ED. FAR. REG.]

PRINCEANA.—No. II.

To the Editor of the Farmers' Register.

I find that my strictures on Mr. Prince's bombastic advertisement, have drawn forth a pungent rejoinder from him; pungent in language, but tame and spiritless in argument. I wish to show that he does not, and cannot successfully controvert the position, that multicaulis trees of southern growth are superior to his own, even with the limitations and modifications with which he now attempts to prop up his vain boasting. In fact, Mr. Prince has almost shifted his ground. It will be recollected that his *challenge* was directed against the multicaulis trees of Maryland and Virginia; for they were the plants that he said had received the encomiums which he thought so unmerited. Mr. Prince now tells us that he does not consider these as *southern* trees; it is only those "of South Carolina and Georgia, and the states south of them," that are of such inferior value. The climate of Maryland and Virginia, is now complimented as approximating so nearly to that of Connecticut, Rhode Island, and Flushing, as to enable us to raise trees almost as good as his own; as even being "*amongst* the best of their kind." With this admission, I see no urgent reason for Mr. Prince's acting on the "defensive." He should have known that discretion was the better part of valor; he might have looked before he leaped.

If I erred in supposing that Mr. Prince meant to include all New England as being adapted to produce multicaulis of "superior growth," the error was certainly a very natural one; for we are distinctly assured in the advertisement as a "truth," that in Rhode Island and Connecticut, "trees of two and three years old are found to be as hardy as an *apple tree*." Now if they are, under these circumstances, as hardy as an apple tree in these states, it is offering no violence to Mr. Prince's argument, to represent him as maintaining that after reaching the above age, they would flourish co-extensively with the apple. In passing through that term of probation, however, they might be reduced to the melancholy condition of the animal, which died just as he was trained to live upon nothing.

But Mr. Prince claims distinguished merit for having *acclimated* the multicaulis; and he deserves it, if he has succeeded as well as he pretends. In the short space of some six or eight years he has been able to accommodate the habits of this production of a tropical climate to the rigors of a high degree of latitude; to infuse strength into its con-

stitution; to educate it like a child; in short, to make it as hardy as an apple tree! Of all the empirical pretensions which Mr. Prince has set up, none is more vain and ridiculous than this. There is no instance on record, of a tender plant becoming acclimated in such a brief period. Heretofore this process has been the work of ages; and whenever the removal has been so distant from its native clime as that of the multicaulis, the attainment of the object has been but imperfectly achieved at last. But in eight years, at most, the multicaulis, a native of the Phillippine Islands, has been endowed with the constitution of the apple tree, by the potent spells of Mr. Prince. Truly the discovery of the philosopher's stone would not have been more marvellous than this sudden metamorphosis. Even the peach, which has been two centuries in America, has not become acclimated to every part of New England; and the Catalpa, the Pride of India, the fig, and the European vine, some of which are natives of extra-tropical regions, do not withstand, without protection, the severity of milder winters than those of New England. On this subject of the acclimation of the multicaulis, I beg leave to refer the readers of Mr. Prince's letter, to an article in the last number of the 'Magazine of Horticulture,' published at Boston, which reached me by the same mail that brought me the Farmers' Register. That article comes from a most respectable source; not less respectable than Mr. Prince, and quite as disinterested; and expresses the conviction, sustained by facts, that the multicaulis will not answer the purposes of silk culture in the New England states. We are informed by the editor, that the aggregate number of trees has not been increased for some years; and that many thousands of them have been totally destroyed. But Mr. Prince has not only over-rated the value of the multicaulis, as applicable to the climate of New England and New York, but he has been assiduously engaged in depreciating those varieties of the mulberry which can alone withstand the severity of such a climate. Witness his letter to the 'Wisconsin Culturist'—his numerous advertisements, claiming for himself the merit of vending nothing of the "*humbug kind*"—and his attempts, covert as well as open, to put down the Alpine mulberry, which has been gradually gaining in public estimation in the northern states, notwithstanding the mill-stone that has been hung around its neck. One might suppose that in the Alpine, Mr. Prince has beheld the ghost of Banquo, in a fair way of reclaiming the rights of which it has been unjustly and insidiously deprived. This variety, (the *morus moretti* or *M. macrophylla* of Europe) has withstood, without being scathed, a degree of cold which has been destructive to the multicaulis. Its growth is rapid; it is readily multiplied by cuttings; and in amount of foliage it is barely surpassed by the multicaulis itself. When all delusion shall have passed away, it will take a rank in the northern states, similar to that which is now held by the multicaulis in the states south of New York.

In making these remarks, I am actuated only by a regard for the interests and success of the silk culture. However desirable it might be, (and to none would it be more desirable than to myself,) that the multicaulis should justify the character for hardiness which Mr. Prince has given of it, yet it cannot, and ought not to be recommended as offering a *safe* reliance for those who are attempting to introduce the culture into the interior of New England, and New York. If it can ever be saved from destruction, it must be by treating it as a perennial or herbaceous plant. Two intelligent gentlemen from Connecticut, who have recently passed through our state, have confessed as much; though, even under this disadvantage, they placed a high value upon it.

So much for Mr. Prince's arguments, and speculations. Let us now examine a little into his facts, and see if they are not equally as convenient to him. He has condemned southern trees, and affirms that in the northern markets they do not command as high prices as those of his own growth. He even appeals to the dealers of Burlington and Philadelphia, in confirmation of his assertion. I happen to know something of the facts of the case; and if Mr. Prince is really so ignorant of them, he might also be greatly enlightened on some points, by consulting those gentlemen. He would not find it difficult to learn that they do decidedly prefer the trees of Virginia and Carolina, to those of the Linnæan Botanic Gardens. During a sojourn in those cities, during the past summer, it was made no secret, that southern trees commanded the preference, particularly as stock for planting, on account of the superior maturity of the buds. It was the first time I had heard the admission so freely made; and I considered it alike liberal, and creditable to their candor. A gentleman near Philadelphia, in his zeal in favor of southern trees, took me to his mulberry plantation, some miles distant, to show me the marked difference in growth between plants raised from Carolina cuttings, and those obtained from his own vicinity, all growing side by side, in land of the same quality. Those that were procured farthest south were so much larger, and more vigorous, that one might have supposed the ground on which they stood had been doubly manured. The Florida and Mobile trees were but little known. Those which had been received, arrived so late in the season, that no correct judgment could be passed upon their merits for propagation. It was thought probable, however, by some, but given merely as a matter of opinion, that on account of the rapidity of their growth, the fibre of the wood might be soft and spongy, and therefore, not so fit for planting. But this objection, even if well founded, could avail Mr. Prince nothing, since he is in the habit of using immature buds in his plantations. In his rejoinder to Mr. Roberts, he contends that they are more prompt to vegetate, and that they produce as good trees as the matured buds. Perhaps Mr. Prince's ingenuity can alone solve the question, whether the ripe wood of the south, or the immature wood of the north, would have a tendency to continue the growth of its offspring to the latest period in autumn? By the way, this practice of planting green buds is a happy commentary on Mr. Prince's claims in regard to the acclimation of the multicaulis. It is one way of acclimating a plant, which is new in the annals of horticulture.

Mr. Prince is very willing to admit that we can raise fine trees in the south—in fact, that they will "attain their utmost developement"—provided we make use of seed produced at the north. This position is not more tenable than the other, that

southern cuttings planted in the north make an incomplete growth. It is an established rule, that the more perfect the organization of the parent, the more healthy and vigorous will be the offspring. I have now before me a letter from an intelligent gentleman, residing at Columbia, S. C., written without any reference to this controversy, and in ignorance of its existence. He says, "I have trees (500) originally from Long Island, five years old, which are not so large or vigorous as those of my own raising, planted in March last!" According to Mr. Prince's doctrine, the succeeding generations could never have attained the same developement as the stock from which they sprung.

Not content with simply claiming a superiority for northern over southern trees, Mr. Prince has undertaken to decide the *degree* of preference to which they are entitled. He says they have one-third more of buds upon them, and are therefore worth 50 per cent more. This assertion is so entirely gratuitous that I cannot imagine how any person having a regard for "truth," could venture to make it. In what respect do they have more buds? Is their developement greater? Mr. P. has virtually abandoned this ground. Are the joints closer together? The proximity or elongation of the joints depend mainly on the size of the plant. A three foot tree at Flushing has precisely the same number of joints that a tree of the same size has elsewhere, excluding the side branches. But a small plant has certainly more buds in proportion to its size than a tall one. Mr. Prince must therefore mean that his trees have more buds *per foot* than southern trees. Granted: but does not this fact imply smaller trees, and thereby impair their value for propagation? A section of such a growth, to be long enough for a cutting, must include a greater number of buds than if the tree was large and vigorous; or if divided into single buds, the pieces are necessarily so short, as to retain their vitality only for a limited time. In regard to the fitness of such wood for propagation, I take the liberty of extracting from a letter written by a gentleman of Flushing, a neighbor of Mr Prince: "Out of 10,000 cuttings," says the writer, "I have raised only 200 trees; cuttings generally turned out badly this year, owing to the season being damp and cold in the spring, and followed by dry weather." The season was equally unfavorable here, but I do not believe there has been any thing like such a failure, in any plantation in Virginia; and from all accounts, Mr Prince's increase from the number planted was not in a much greater proportion.

Mr Prince says I have evaded his wager, instead of accepting it. On this point I must differ with him; for he has never ventured to make it in plain and explicit terms. His first proposition was this: "We now offer to exhibit one, two, three or more thousand of our trees, with any plantation of *one year's growth*, of the same kind, existing in Maryland or Virginia." This offer designates no specific age for his own trees; and if it had been accepted, it might have possibly comported with Mr Prince's notions of a fair "competition," for him to have exhibited *two-year old trees*, while he restricted us to those of one year's growth. Neither does his last offer, though apparently made in such a spirit of liberality, fully meet the case. If he was as sincere and earnest as he affects to be, and really believed in the great superiority of his own trees, he would not be willing to claim any advantages in the contest. I therefore, again assert, that Mr Prince *dare not* show his trees on fair and equal terms. It is now too late in the season to be exhibiting southern trees, as our slender stock is very nearly exhausted; but if Mr Prince will renew his wager for another year, and will say, "We now offer to exhibit in the autumn of 1839, one, two, three, or more thousands of our multicaulis trees grown in New York, or New England, from cuttings planted in the open ground, the ensuing spring, with a like number, grown in the same manner, in any plantation in Maryland or Virginia; and if ours are not superior in the growth of the wood, and number of mature buds, to any other parcel of similar extent, we will pay to the owner of the other parcel one thousand dollars, or one thousand of the trees, he agreeing to pay a similar forfeit, if the reverse is the case." I say, if Mr Prince will make this offer, he will redeem himself from the reproaches he has incurred, of vain-boasting, and insincerity; and his desire for competition shall, in due time, be gratified.

A word in regard to Mr. Prince's personalities, and I have done. He has indulged in them throughout one half of his communication, evidently for the purpose of withdrawing attention from the matter in dispute. They are, however, as harmless in the effect they may have been intended to produce, as they are misdirected. The editor of the Farmers' Register is abundantly able to rescue his own conduct and motives from aspersion; and the arrows of Mr. Prince have not reached me, either directly, or through the sides of another.

ANTI-PUFF.

ON THE SEVERAL CLAIMS TO THE MERIT OF HAVING FIRST INTRODUCED THE MORUS MULTICAULIS.

From the Richmond Enquirer.

You will recollect, that it was at your request, received on the 10th, that I addressed a hurried communication for the 'Enquirer' of the 12th October last.

I now desire, through the same medium, to notice a letter of Wm. R. Prince of the 1st of November, 1838—a postcript to the same, dated the 22d of December, following, addressed to the editor of, and published in, the Farmers' Register, vol. 6, No. 12, pages 753 and 4, and also an extract of a letter from Mr. Prince, to Gideon B. Smith, dated the 12th of July, 1830, published in the same No. of the Farmers' Register, page 754.

In my communication of the 12th of October last, I expressed the *belief*, based upon good authority, as I then supposed, that we were indebted to Dr. Norton for the introduction, &c., of the morus multicaulis in this country. During the session of the silk convention in Baltimore, in December last, and since my return, I have obtained such information as induces me now to *believe*, that I was mistaken in the *belief* then so hastily expressed; and as there are now three persons claiming that distinction* I shall not, until I see the title deeds legally authenticated, venture the ex-

* Wm. Prince and Son, Dr. Norton. and M. Besson. See F. Register, vol. 6, No. 12, p. 755.

pression of an opinion as to the proprietary title thereto.

Now for the letters. What does the letter o. November 1st say, (alluding, I suppose, to the simple expression of my *belief?)* "I am not content to let such flimsy statements pass, without a suitable rebuke"—and, how does he rebuke the "flimsy" statement—let us see—to wit: by stating in his letter to Gideon B. Smith, on the 12th of July, 1830—yes, on the 12th of July, 1330—"I should have been pleased, if you had stated, that your Chinese mulberry tree" (now the multicaulis) "came from me—I don't believe *one tree* exists in the country, but yours and mine: we have *about* twenty"!!! What does he say? On the 22d of December, 1838, he says, I sent to Dr. Norton "in the fall of 1828, or spring of 1829, the Phillippine Island mulberry, it not having, at that early period, received the title of morus multicaulis."

If, then, in July, 1830, *Gideon B. Smith had but one tree, and William R. Prince only about TWENTY!!! and THE about TWENTY-ONE trees were ALL then in the country, how could he (Wm. R. Prince,) have sent, in the fall of* 1828, *(near two years before,) a tree to Dr. Norton?*"

Is this the promised rebuke of a "flimsy statement?" If it is, there is in it more ********* than *****. I now leave it to the public to say, whether there is more *flimsiness* in my statement than there is *discrepancy* in his own.

Again—According to the testimony of Mr. Carter,* (postscript, December 22d, 1838, upon which Wm. R. Prince relies to show that Dr. Norton had, in the spring of 1828, a tree (morus multicaulis) agreeing "precisely," as he says he sometime since suggested to Gideon B. Smith, it is shown, that Dr. Norton was in possession of the tree as ealy as the spring of '28, and that the doctor and John Carter were propagating rapidly the morus multicaulis in the summer of 1828, whereas he had but about twenty trees in July, 1830, more than two years thereafter; which, with the one then in the possession of G. B. Smith, he, in the same month and year, (12th July, 1830,) stated, "he *believes* are the only trees in the country, (a belief which he must eventually contend was "a flimsy statement,") and which he cannot be "content" to let pass without a suitable (self) "rebuke."

To conclude: I entertain no unkind feelings towards Wm. R. Prince—for Gideon B. Smith I have the highest respect. I have studiously avoided the use of harsh language, other than such as W. R. P. used himself, and have only sought to show, that others, who ought to be better informed than myself, may have been mistaken† in their *belief*, as to whom belongs the credit of the first introduction of the morus multicaulis into this country. I leave the question of first introduction to be settled by the three claimants, and shall not, probably trouble you again. J. W.

* In this statement, there is a radical error. It is this: Wm. R. Prince never saw *John Carter*—another *flimsy statement*, deserving (self) "rebuke."

† See Farmers' Register, p. 393, 46th to 51st line, and vol. 6, No. 12, p, 754.

From the Farmer's Magazine, (1808.)

COUNTY AGRICULTURAL REPORTS.

The idea of ascertaining the agricultural state of every district in the kingdom, and of printing each survey, according to one uniform model, is the greatest undertaking ever attempted by any institution; and, though carried on with funds extremely inadequate to such an attempt, yet it is at last in a fair way of being happily accomplished. All the counties in England will be completed in the course of this year. Several will remain to be done in Scotland, for the execution of which fit persons can be procured, as soon as adequate funds are obtained for that purpose. In the course of this year, five reports have been already printed, and eight transmitted to the board in a state ready for publication; so that the progress has been considerable, and the termination of this most important undertaking, by which so large a proportion of the funds of the board has hitherto been absorbed, is probably at no great distance.

The advantages to be derived from these reports, are universally recognized in foreign countries; for the same plan has been already adopted in France and Russia, and will probably be imitated in every other civilized country. A letter has lately been received from a celebrated agriculturist in France, in which he states his opinion, "that such a measure is the most useful that can be undertaken, for bringing, in a short space of time, agriculture to a high degree of perfection."* Indeed the information furnished by the various reports and communications published by the board, far exceeds what is generally apprehended. Dr. Coventry, Professor of Agriculture in the University of Edinburgh, who, from his situation, is led to examine every work connected with the subjects on which he lectures, has recently declared, 'that in these late reports and publications, there is detailed more useful and distinct information, on various branches of agriculture, and on rural concerns in general, *than was in print before these were drawn up.*'† What then may not be expected, when all these reports are completed, for little more than one-half of them were printed, when this idea of their merit and utility was formed by Dr. Coventry.

IMPORTANCE OF AGRICULTURE.

To prove the importance of agriculture to a community, seems very like demonstrating the advantages of having food to eat and clothes to wear. That it is, indeed, the first and greatest concern of every nation, and the foundation of its prosperity in every other matter, is a truth so universally acknowledged, that it has obtained almost the currency of a proverb.—*Farmers' Cabinet.*

* The French expressions are, 'Je crois que ce travail est le plus utile de tout ceux qu'on peut entreprendre, pour amener, dans un tres court espece de temps, l'agriculture à un grand degré de perfection.'

† See discourses explanatory of the object and plan of the Course of Lectures on Agriculture and Rural Economy, by Dr. Coventry, 1 vol. octavo, printed at Edinburgh, 1808, p. 187.

For the Farmers' Register.

ESTIMATES AND REMARKS ON THE PROFIT OF IMPROVING LAND AND FARMING.

To the farmers of Virginia, who are too cautious and too much of false economists to improve their lands, by bringing all the means of improving within their reach, the following remarks are respectfully offered. He who gets rich as a merchant by buying and selling produce, runs great risk of being poor by some fortuitous accident. Every day occurrences teach us this. He who speculates in stock, in gold mines, in multicaulis buds, may suddenly get rich in imagination, be a nabob to-day, to-morrow a beggar: of this we have too many examples, in these days of lottery offices, and all short cuts for getting rich in an hour. But he who ventures a penny to improve his land, in fact runs no risk at all; he gains his pound without a venture of a penny; his return is certain. Who, from the days of Æsop until now, ever heard of any man who seduously and understandingly went about to improve his land, and lost by it? Some may have come to ruin from extravagance of another sort; but never by any money spent directly on the improvement of the soil they cultivate. This may be a slow, but it a certain way of becoming independent, and riches got in this way stick. They don't come like an April shower, and vanish like the dew. Why then, farmers of Virginia, shall we leave our calling and follow after that which belongs to speculators? "Slow and sure," says the proverb—and "a bird in the hand is worth two in the bush;" let us then leave the golden bird that perches in the multicaulis, to those who are more expert bird-catchers than we; and let us hold steadily to the bird in our grasp. You who are the holders of rich land, I ask to look at the following calculations, for encouragement to keep it rich: you who hold poor land, read them, and be stimulated to make it rich; but both read poor Richard's almanac the while, and learn, that "he who by the plough would thrive, himself must either hold or drive." No manure will answer without the master's foot.

Landlord No. 1.	*Dr.*	*In ac't twenty acres Land, at* $100 *per acre,*	*Cr.*
To interest on cost of land, $2000,	$120 00	By 72 bbls. corn, at $4 00 per bbl.	$288 00
To cost of a man and horse, 1 year,	250 00	By offal from corn,	30 00
Wear and tear tools,	20 00	By 150 bus. wheat, $1 50 per bush.	225 00
Additional labor in harvest, &c.	40 00	By 24,000 lbs. clover-hay at $7 00 per m.	168 00
Cost, hauling and spreading 300 bus. lime,	90 00	By 400 bus. Irish potatoes, 50 cts. per bu.	200 00
Cost, hauling and spreading 300 bus. ashes,	30 00	By wheat-straw, peas, &c., say,	19 00
Cost, hauling and spreading 240 loads manure,	120 00	By whole am't profits,	930 00
To seed, wheat, corn and potatoes,	20 00		
To plaster and clover seed,	10 00		
To whole am't expenses,	$700 00	Balance Cr.	$230 00

Landlord No. 2.	*Dr.*	*In ac't* 20 *acres Land, at* $10 *per acre.*	*Cr.*
To interest on $200,	12 00	By 18 bbls. corn,	72 00
To cost man and horse for 1 year,	250 00	By offal from corn,	7 50
Wear and tear of tools,	20 00	By 6000 lbs. oats, at $7 00 per m.	42 00
Additional labor,	5 00	By 12 bush. peas, at $1 00,	12 00
Seed-oats, corn and peas,	5 00	By pasturage, 8 acres poor land,	6 50
To whole am't expenses,	$292 00	To whole amount profits,	140 00
Balance Dr.	152 00	Balance,	152 00
			292 00

In the annexed account No. 1, I have supposed the twenty acres laid off into three equal fields of six acres each, with a lot of two acres for trucking (if I may make a word.) It will be seen by reference to it, that landlord, number 1, after paying a high price for his land, put manure of different sorts on it to the amount of $250 per annum; and still the land pays this sum, current expenses, and pays him within a fraction of 12 per cent. on his investment; so, that it is apparent, under this system, he will be able to keep his capital increasing in value, while he is at the same time, making 12 per cent. on it. It is equally apparent, that landlord number 2, who wraps his one talent in a napkin, will be brought in debt every year, to an amount equal to more than twelve times the amount of the interest on his investment. What folly then to work poor land without improving it; the means for which every man possesses more or less, on or near his land. If the class I address could lift the veil which covers my name, they might say "physician heal thyself;" but I hope with less truth every day, for I am striving to benefit myself and posterity, while I am helping to brace up our dear old mother Virginia, who is fast sinking under the ruthless treatment of her children; who nourish her with nothing, while they are tugging at her empty dugs, and killing her, while they are starving themselves to death; all for the want of a little energy and enterprise. As a general rule, let me advise my fellow-laborers, if you want productive seed-corn, manure your land, and carefully save the seed; if you want fine wheat, fallow and use lime, and your seed will be good; if you want improved cattle, first rear grass for them to eat, and don't buy a Durham bull at $1000 or 2000 to feed him on straw and shucks in winter, and buds and marsh grass, in spring and summer. It will not answer; his breed, in ten years, will be no better than the common cattle of the country; whereas if you had laid out this $2000 in manure, lime,

grass seed and plaster, besides the improvement of your land, you would have in the ten years, converted all your cattle into Durham, without a bull of that breed. I do not mean to throw a damp on judicious importations of stocks, &c. I only mean to ridicule that class, who are guilty of the folly of supposing they can make a week's old bantling, a man, by going to a tailor's and buying him a man's suit of clothes; instead of nourishing him well, and keeping him warm, and giving him time to grow, and develope, with nature's aid, the resources hidden within him.

Mr. Editor I see you yawn. I take the hint, and am, yours, &c. ANTI-HUMBUG.

PROGRESS OF THE MORUS MULTICAULIS TRADE, AND PROSPECT OF FUTURE PRICES.

Inquiries have been frequently made, by letters as well as verbally, and proceeding from strangers as well as from acquaintances, as to our opinions in regard to the probable continuance, or decline, of the high prices of morus multicaulis plants—and consequently, the expediency, thence to be inferred, of entering upon, or avoiding, the "mulberry speculation." These inquiries have been answered to the best of our judgment, not only by our published and general views, but also privately and specially. Still, we have felt reluctant to express opinions, or give advice, not only because the progress of the speculation had outstripped and belied all our previous calculations, but also because our private interest, of ownership, had become deeply involved in the market value of the plants.

The views which we entertain on this subject are, perhaps, but of little worth; but such as they are, they will be given here frankly, in answer to particular inquirers, as well as for the information of readers, and the agricultural public in general.

The prices of multicaulis plants have, in the general, been slowly advancing, from the time in September when we pronounced them to be exorbitant, to this day. There was a decline in November, which seemed to indicate the bursting of the bubble of *speculation*, or *factitious* prices. But the depression was but transient, and was caused by that being the time for *paying* for all the prior purchases; and many persons who had bought without money, and expected to pay by their profits on sales, were compelled to put the plants in market, and sell them at any price which could then be obtained, to meet the debts incurred by their purchase. Since, the prices have not only returned to their previous mark, but have gone beyond. The regular and current prices now, in Richmond, are 3 cents the bud, for cuttings, or entire plants exclusive of roots—20 cents for roots of plants of one year's growth from cuttings—and 20 cents the foot for trees of that age and kind, with or without lateral branches, and taken as they come. There are not many plants now in market, as nearly all are now held to plant; and neither are there many persons seeking to buy at present. There are, however, enough both of buyers and sellers to show prices fairly.

Several public auction sales have been recently made in New York, and reported in the newspapers as having brought much higher prices than the above mentioned—as high as 25 to 30 cents, the foot for small plants; which would be equal to about 4 cents the bud, ripe and green—if any of the wood was immuture. But we have no faith in the reports of these auction sales; as it is very easy, by fraudulent combination, and fictitious bidding, to make prices appear to be as high as the parties may please, or may dare to venture on the public credulity.

The occurrence of one or the other of the opposite results, either of the stock of plants now in this country being of immense value to the owners and the public, or of no value whatever, will depend upon this—whether silk culture proper shall really be commenced and prosecuted to any considerable extent, or that no more is done towards that end than had been when this mulberry speculation was produced, and the prices were rising to their height. If the first-named and most desirable result should be produced, and the culture of silk should be established, so as to promise soon to become an important branch of industry in the United States, then there will be sufficient demand for every multicaulis plant that can be raised in 1839, and at prices yielding good profits to those who plant even at the present high prices of cuttings. But if there should be no more solidity in the present increased and more extended movements towards silk-culture, than was in all those of the north, which had so much sought to attract public attention and gain notoriety, previous to the beginning of this speculation, then the value of plants will sink to nothing as soon as the bubble bursts; and the mulberry mania will compare in all respects with the famous tulip-mania of Holland, and serve to produce, and to leave, as little of real value to the holders, or to the country at large.

In an article of considerable length published in our last October number, we stated fully, and *proved*, that the previous pretended silk-culture of the northern and middle states had resulted in almost nothing; and then supposing that the future was to be judged by the past operations, we pronounced the then rising demand and prices of multicaulis plants as the work and effect of speculation. And we believe now, as much as when the opinion was first declared, that the sudden and rapid advance of the market price of multicaulis plants was almost entirely built upon trading spec-

ulation; and if it had continued to be as baseless as it then was, the price would probably have fallen before this time. However little of the reasoning process there may be in deriving proper views of the profits of silk-culture from the existence of a baseless mulberry speculation and mania, there seems now to be good ground to believe that such has been the effect; and that very many persons have thus had their minds, for the first time, effectually directed to this valuable and (as we have long maintained as to Virginia,) profitable branch of industry. We may venture now to say that silk-culture will be commenced by many persons in Virginia and other southern states, and fairly tried; however little creditable it may be to the judgment of the people that this good result will have been produced, not by the sufficient proper inducements which have long existed, and been totally disregarded, but by the stronger stimulus of the mulberry mania; which ought rather to depress than to encourage silk-culture, by making the undertaking so much more costly. But correct reasoning is seldom the mode by which communities arrive at results, or are induced to make changes of old habits; and if such a beneficial change is now to be made, in the adoption of silk-culture, we may be content to welcome the benefit, without scrutinizing too closely the legitimacy of its origin.

Before the commencement of the speculation in mulberry plants, all the establishments for silk-culture of this country, which had for some years been so conspicuous *on paper*, were in the northern and middle states; and to that time, nothing had been performed by any of the numerous silk-companies, to redeem their promises and make good their great pretensions. The facts in regard to these liberal promises and small performances were stated at sufficient length in the article above referred to, and also in another, subsequently, by T. S. Pleasants, commenced at page 449 of vol. VI. In the south, almost nothing had then been done, either according to the northern fashion of conducting silk-culture, or truly and really by feeding silk-worms, and producing silk. The mania for buying mulberry plants spread from the north where it commenced, even more rapidly through Virginia and the adjacent states. But most of the purchasers were of different character, and so will be the effects of their operations, whether caused at first by delusion, or by correct views. At the north, after prices had been advancing, and the mania growing, for several months, and when sales were making daily, and the contracts perhaps had covered an amount far exceeding that at which all the multicaulis plants in the world would have been estimated a few months previously—still the buyers were nearly all mere speculators, and of the most transient operation, who designed to sell again, and very speedily. Very few purchases had been made by farmers, or persons who designed to plant; and, very often, the same lot of plants had been sold several times over, and at continually advancing prices, while they were still growing in the ground of the original proprietor. So far as these went, and they were the principal operations, the trade was simply and purely a speculation, having no regard to the intrinsic value, or future uses of the commodity.

As soon as the new and great demand was generally made known in Virginia, (though it was not soon enough to prevent many lots being bought up at half-price by speculators,) the fever spread and raged here more than even at the north. For instead of being confined there to mere traders in the then existing plants, there arose here a very extensive demand among farmers and others who bought to plant. Thus, except a few large purchases made to supply the great and general demand for small parcels for planting, and which served merely to supply that demand, every purchaser in Virginia bought to make profit by planting, and the future increase and expected value of the product. It is true, that all of these persons also were speculators, though in a different sense. They differed from others in this only, that they speculated on the market value of the *future product*, instead of the present stock purchased by them. But though the large majority of the numerous southern purchasers (unfortunately,) had no view to silk-culture, and many also deluded themselves by extravagant expectations of high prices of future crops of plants —still there are enough of them who design to commence silk-culture proper, to insure fair and extensive trials, and the sure establishment of that branch of industry, should it be approved by the first adventurers. Should this be the result, or even a sufficient promise of it appear during this year, there will be hundreds of those who bought upon mere speculation, who will deem it profitable to retain part of their stock this year, and to increase it hereafter, for its legitimate use in feeding silkworms.

To produce the beneficial and important result of establishing silk culture in Virginia, and thereby to insure a demand for all the growing trees, it is not at all necessary that every one, or that most, of those who have bought mulberry plants shall commence that business. If one only in twenty of the present buyers, or one in five hundred of the farmers who are properly situated for it, should begin to raise silk, these will be enough to spread the business, and to maintain a sufficient demand for plants through this year.

But by a "*sufficient demand*," and sufficient profits for cultivation, we do not mean to affirm, what is believed by many persons, that the present high prices of plants will be sustained for the next growing crop. Such expectation is ridiculous; and if it were possible that it could be realized, the result would do much harm to general interests—though they would be very favorable to the interests of individual cultivators, and to few more than to our own. But if the prices next autumn should be not less than one-fifth part of what the cultivators pay for the stock to plant, they will, with a fair average product, make great profits on their investment and cultivation. Should the prices be one-third of the present rates, planters will make enormous profits; and still more those who bought their stock for planting at much lower than the present rates. And if there should be (what seems now not impossible,) a general awakening throughout the country to the advantages and profits of silk-culture, then the whole stock of plants in this country will not be sufficient to supply the demand of those who will desire to obtain them for propagation, even if without any view to the selling of trees. Should this be the case, each person will take many or few, according as the price may be low or high—thus insuring high prices for a very limited supply, or sufficient demand and remunerating prices for the largest supply.

The same money-price of these trees may be very high, or abundantly low, to purchasers, according to the object of purchase, or their intended future use. If the great demand were merely for speculation, as it was when first produced, we should consider *any price as too high* for planting, and that one-third of the present rates would be enormous. On the other hand, if designed to be put to proper and profitable use, prices higher than the highest yet known can well be afforded for small parcels, to put the purchasers in stock. For it should be borne in mind, that it is not the handful of little twigs for which the buyer pays, perhaps, more than its weight in silver—but for the product which he expects to obtain from that stock. So great is the facility and certainty of extensive and rapid propagation of the multicaulis, that $100 worth of stock to plant, at the highest prices, if taken the best care of, would, in the course of two years, produce from 60 to 100,000 trees; which, at proper distance, would be as large a mulberry plantation as most cultivators would desire to have. Allow one year more, and a commencing stock of only $5 worth will do as much. The only question, then, for the planter and the intended culturist, will be, whether the *time* or the *money* may be of the most value to him. But in either case, the combined cost, in time, labor, and money, will provide a capital for silk-raising more cheaply than the apple orchards were raised formerly in lower Virginia, for making brandy, and which were then considered as an indispensable appropriation of land and capital on every farm. If a kind of apple tree had then been introduced which was as easily propagated as the multicaulis, and would furnish a full crop of apples in two years, then it would have been cheaper for the intended brandy-maker to buy a stock of those trees at 3 cents the bud, rather than the ordinary grafted trees at the usual low prices. It is the wonderful ease and rapidity of propagation of the multicaulis, which is bought, and which causes and justifies the high price to those who design to profit by its use, and not merely by sales. For we repeat, that without using, and availing of its intrinsic value, and to sufficient extent, in the country generally, that, at any price, the purchase of plants will be too dear. But this faculty for reproduction, which causes and justifies high prices, must as certainly operate to reduce them speedily to almost nothing, as articles of sale. We therefore have little confidence in the not uncommon opinion that multicaulis plants will maintain profitable prices, or indeed be worth raising for sale at all, in general, after the present year.

The speculation in this country has spread to France. Some American orders were supplied there, and sales of plants imported thence have recently been made in New York. But the eagerness of the American purchasers soon advanced the prices in France 300 per cent, and then the holders refused to sell, choosing to reserve all their stock for planting. But the whole stock in France, and all Europe, if not in Asia, is smaller than that in the U. States; and, therefore, can but little affect the market here by furnishing supplies. But it is more likely that the fever of speculation will be as fully spread there, and, consequently, not only very high prices be maintained, but that there will also be produced a better knowledge and higher appreciation of the intrinsic value of the morus multicaulis than has heretofore existed in France.

From the New England Farmer.

MULBERRY FEVER.

[The following article presents views somewhat differing from the foregoing. The writer's compliment to the inventive talent of his countrymen was not undeserved. We have not heard yet whether the fabrication of silk-worms eggs, which he anticipates, has been commenced; but, it appears from the 'Northampton Courier' that there

are in market multicaulis cuttings manufactured from twigs of bass wood.—Ed. Far. Reg.]

This new disease has become quite epidemic and continues to rage violently. We cannot for our lives divine any especial reason, why it should have burst out all at once among us and so widely extend itself, excepting that all the diseases of this character, (we mean those brought on by speculation and avarice,) are highly contagious. We trust it would not be deemed disrespectful to the faculty, if we suggested that possibly the mulberry doctors have themselves had some hand in creating and aggravating the disorder with a view to their *****. It is not for us to give any words of caution. We have not the care of the public health; but we think it advisable for those, who desire to keep well to keep out of the way of contagion. The disorder has in some parts of the country risen to a state of raving madness, and men, like insects round a fire in the woods of a dark night, are seen dashing into the flames. We have no doubt that the silk business is to be one of the great interests of the country, and one of the most productive and profitable of agricultural employments; but the mulberry tree business and the raising of silk are not precisely the same. One would think, however, from present movements, that every thing is to be accomplished the next year; that the end of the world is to come then; and that the "wedding garment" is to be made of silk of man's own raising. When from a single multicaulis tree perhaps a thousand or more buds or cuttings can be taken in a single season, each of which will in one season, with good luck and good care, form a handsome tree, certainly there need be no difficulty apprehended in the propagation of the plant. When a hundred and sixty or two hundred or four hundred dollars are demanded for a pound of mulberry seed not at all sure to come up,* which can be imported for a twentieth part of that sum with equal confidence of success, we cannot help asking ourselves, where does the money come from, or where has the shrewdness of our merchants and sea-captains gone to? When half a dollar a piece is asked and paid for trees which were grown this season from seed sown last spring and represented to be of equal or superior value for feeding worms with any trees grown, and especially because it is stated that they will "stand our climate," we are really very curious to know what is to be the price next year of cabbage plants; and whether we cannot afford to raise *them* upon a considerable scale at somewhere about forty-nine cents a plant. When silk-worm eggs, which were formerly thought high at eight cents per thousand are now sold for twenty-five cents per hundred, and fifty cents per hundred are even contemplated, we are strongly inclined to believe, and we encourage those who are too anxious to begin at once, to wait patiently; that our Connecticut wooden-nutmeg gentlemen before spring will have an ample supply to meet any demand, dropped on the best hot-pressed letter paper, and made out of the purest yellow bees-wax. But the flame is kindled, and the furnace glows with a white heat. Let those, whose wings are not made of asbestos, try the intensity of the flames if so they choose.

H. C.

* And which *cannot* produce the *multicaulis* mulberry, even *if it should* come up.—Ed. Far. Reg.

LIMING.

To the Editor of the Farmers' Register.

December, 1838.

Dear Sir,—I enclose you my annual five dollars, and return you many thanks for the much and varied information which you have given me in the last year. I should send you some communication for your valuable work; but I forbear—for my friends and neighbors have given me to understand that they think me possessed of a *calcarious devil*. Poor souls! Could I exorcise myself, and cause my devil to enter into them, as into the swine of old, how great would be their profit!

I have purchased since June 1st twenty thousand bushels of oyster shells, and am now hauling, burning, and spreading: my wheat field shows that dear old Mother Earth endorses my work, and I am in grief that I know not how to make her grateful acknowledgments in appropriate terms. But I have a notion that by laws peculiar to herself she marks in characters not destructable by time the deeds of her children. Assuming this, it is not easy to enter into my joys when I spread upon her lap fields of golden corn, or throw over her nakedness a rich green robe bordered with gold. I halt my hobby for a moment to ask if feelings like these can lead to destructive ambition? Happiness is the great object of every being of mind; and who is so happy as he who receives the applause of his mother for virtuous or benevolent deeds? And then, sir, are not the claims of mother earth paramount? Who feeds the hungry? Who clothes the naked? 'Tis she, dear old soul, and it is my duty to make her shine as the morning star. The selfish nature of man has blinded him and turned his thoughts from his first and greatest duty—his duty to the fountain of all good, Mother Earth. I wish you great prosperity, for in that, the whole human family will participate. Respectfully, your friend, &c.

EFFECTS OF LIME AS MANURE.

To the Editor of the Farmers' Register.

January, 1839.

Your call upon the subscribers to the Register is too just to be resisted or derided. Original communications only can keep up an excited interest in your valuable work; good as your selections are, they belong to agriculture generally, as a science, and not to particular localities. You will however, agree, that it is a dull and irksome business to preach to unbelievers; as well might I go into my pasture and exhort my hogs not to destroy the means of their own welfare and subsistence, as to give you, for the cultivators of the land, in general, any thing about improving husbandry, if the course recommended involves any thing like immediate expense. Some of my neighbors have been induced to use clover and plaster, but were warned of the sure result, if they did not make their land dry. This did not suit them; and the result was absolute failure. Now, sir, would you believe that this gave them occasion for believing that plaster did not suit their land? Why, sir, stable dung would fail under the same circumstances.

In the last three years I have purchased forty thousand bushels of oyster shells, and some lime-

stone from the country above Harper's Ferry. I have passed over 650 acres of land, upon which I have used about 35,000 bushels; and if I allow much for my mania upon this subject, my farm has returned me the money expended, and yet holds a surplus for farther operation. I shall not go into detail, but I hold the record of my predecessors which enables me to show that my annual produce is not less than eight times as much as theirs; and this record is for eight or ten years. I speak not of this in boast, for I blush to think that I have not done better. I began farming when young, and had none to counsel with. If I suggested to my neighbors what I expected, I could see that they pitied my folly or my ignorance. I offered my property again and again for sale; for my heart sickened with hope deferred. I remembered that that great man Moses had used up 40 years in effecting his purpose; but that he finally saw the land of "milk and honey," and I tugged still at the "tough oar." The strife was fearful; for after draining my land, it had been so long drowned that it was not productive. About the time that I had settled this fearful inquiry, I met with your 'Essay on Calcareous Manures.' I had before made two experiments with lime some years apart; but I resolved upon a third; for I saw that the land was wet upon which I had failed. This burst upon me like the sun of Austerlitz did upon that meteoric man Napoleon; and since that, more care in draining makes the lime work like a charm. If I run riot, sir, upon the subject of lime, you must give me room. I would not willingly harm any person; but to me, it is meat and bread.

* * * * * * *

I sold this season past $200 dollars worth of turnips, from one acre of land, and I assure you, sir, that until the equinoctial rain, I did not think I should make one bushel. It was passing strange to see how rapidly they grew. I made a good crop of corn from the rain we had upon 13th August; and one thing good for philosophy to know attends it in a very curious degree. It is the flint-like character of the cob or husk. I do know that timber grown in lime-stone land is much heavier than that grown in other land; is it the same with corn? LIME.

For the Farmers' Register.

MONTHLY COMMERCIAL REPORT.

Speculation has been more active than usual, in the absence of recent intelligence from Europe.

The ascertained short crop of tobacco in this country, causes prices still to advance, and they are now about $2 per 100 lbs. higher than in December. The lowest quality of new lugs $9 to $10, and new leaf $13 to $17. Purchases are confined chiefly to manufacturers.

Cotton has also advanced about 2 cents, and may now be quoted 13 to 14 cts. The receipts and shipments from all ports, in the aggregate, are considerably short of last year's at the same period.

There has been little variation in the price of flour. A small advance has been realized in some markets, but the current rates are still about $8¼ for all but city mills—which is held at $9.

Wheat commands 165 to 175 cents.

Feb. 1, 1839. X.

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